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The I.L.O.

The International Labour Organisation is an intergovernmental agency, of which 96 countries are members. Representatives of governments, of management and of labour organisations participate in its work. It was established in 1919 and entered into relationship with the United Nations as a specialised agency in 1946.

Its purpose is to promote social justice in all the countries of the world. To this end it collects and disseminates information about labour and social conditions, formulates international standards and supervises their national application. It also engages in operational activities and provides technical assistance in carrying out social and economic development programmes.

The machinery of the Organisation consists of—

The International Labour Conference, which is the supreme body of the Organisation. It constitutes a world forum for labour and social questions. National delegations to the annual meetings comprise four delegates, two representing the government, one representing management, and one representing labour; each delegate speaks and votes independently, so that all points of view find full expression.

The Governing Body, composed of twenty government representatives, ten representatives of management and ten representatives of labour, which is the executive council of the Organisation.

The International Labour Office, which acts as a secretariat, an operational headquarters, a world information centre and a publishing house. It is staffed by experts drawn from many different countries, whose knowledge, experience and advice are available to all nations which are Members of the Organisation. It has branch offices and correspondents in many countries.

The Conference adopts international labour standards which are formulated in special international treaties called *Conventions*, and in *Recommendations*. These are based on careful fact-finding and discussion. As a two-thirds majority of the Conference is required for their adoption they represent the general agreement of informed world opinion. The decisions of the Conference are not automatically binding, but governments must submit the Conference standards to their national legislatures. When the legislature accepts a Convention the government is bound to apply it.

On the operational side the I.L.O. provides governments with expert advice and technical assistance in matters connected with labour and social policy. For this purpose it has established in various parts of the world field offices which serve as centres for assistance to governments in such matters as building up employment services, increasing productivity, the development of training facilities and the administration of social security programmes. The I.L.O. participates in operating the United Nations Expanded Programme of Technical Assistance.

The work of the Organisation also includes the holding of regional conferences, sessions of Industrial Committees to discuss the problems of particular industries on an international basis, and a variety of specialised technical meetings.

All these activities are closely co-ordinated with a view to fulfilment of the purpose for which the International Labour Organisation was created—the promotion of social justice and peace.

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Ergonomics: the Scientific Approach to Making Work Human

There is nothing particularly new in the notion of seeking to adapt man's working environment to his needs and capabilities; but research into the physical and mental capacities and limitations of human beings in order to develop precise information which can be used in designing tools, processes and a working environment better adapted to human capacities, is of relatively recent origin and is the object of a new technique known as ergonomics.[1]

The aim of this article is to present some of the results of this research and to indicate how it has been and can be applied. After a general introduction, the paper describes the historical development of ergonomics, outlines the various fields of the human sciences concerned, and discusses the practical application of ergonomics in industry from the economic and the humanitarian point of view. A list of selected references is appended.

LIKE all living creatures, man has always had to adapt himself to the conditions existing around him; but in spite of his extraordinary powers of adaptation, he has ever striven to modify his environment in the interests of his comfort. He learned to protect himself first from the inclemencies of nature by wearing warm clothing in cold weather and improving his housing, and later against the harsh environments of his own creation, for example from the heat radiation from glass and steel furnaces, by wearing protective clothing and dark glasses. But it is only quite recently that developing technology has enabled him to make any great strides in moulding his environment to his needs, for instance by providing air conditioning for rooms or whole buildings and modify-

[1] In the United States the term generally used for this technique is "human engineering". In Western Europe, however, the word "ergonomics" is preferred, and will be used throughout this article. The essential disciplines contributing to ergonomics are physiology, anthropometry, psychology and engineering. Thus ergonomics may be defined as the application of the human biological sciences in conjunction with the engineering sciences to achieve the optimum mutual adjustment of man and his work, the benefits being measured in terms of human efficiency and well-being.

ing his working environment by the application of engineering techniques aimed at eliminating its noxious and unpleasant aspects.

In his work he has shown a great ability to develop appropriate tools and techniques ; and, so long as technology developed at a relatively slow pace, the traditional genius of the craftsman continued to have full play and he was able to develop or adapt tools and techniques to the minor changes which occurred. However, with the speed-up in the rate of technological development which first became manifest in limited areas during the Industrial Revolution, the old craftsman tradition, which tended in the course of time to bring about perfection of tools and their adaptation to slowly changing skilled manual tasks, was no longer appropriate. Such traditional processes lagged behind the new needs and possibilities, with the result that more and more well-tried tools and machines have been found, in the face of modern technological conditions, to be relatively ineffective for human use. The mental inertia which prevents established tools and processes from evolving in step with technological change has long been evident to acute observers. For instance in 1831 Charles Turner Thackrah observed—

> We see no plump and rosy tailors : none of fine form and strong muscle. The spine is generally curved . . . pulmonary consumption is also frequent. [However, in regard to his present faulty working position], let a hole be made in a board of the circumference of the tailor's body and let his seat be placed below it—the eyes and the hands will then be sufficiently near his work ; his spine will not be unnaturally bent, and his chest and abdomen will be free.[1]

The " happy tailor " of the earlier guild period, with his traditional cross-legged posture, had degenerated into a sickly individual, abnormally bent over his workplace, usually toiling under bad lighting and other adverse working conditions, whose deplorable working posture provoked the alert physician's observation. Even more so can this be said of the spinners and weavers of the period, whose translation from the home to the factory led to deterioration in their working conditions and consequently in their health.

Another instance of this lag in modifying a process to meet human requirements may be found in the difference between the layout of the early typewriter keyboard and the modern arrangement. The disposition of letters on the old keyboard followed the traditional layout of the type case dating back to the Middle Ages and, although inefficient for printing English, it had been excellent for printing Latin, which had been its original purpose. The layout of the present keyboard was developed on the basis of experiment and study intended to improve work output by arranging the

[1] C. T. THACKRAH : *The Effects of Arts, Trades and Professions on Health and Longevity* (1831). Republished in 1957 by E. and S. Livingstone, London, with an introductory essay by A. Meiklejohn.

letters in such a way that those most frequently used were located under the strongest fingers of the typist's hand and those little used under the weakest fingers. Here we see the process clearly illustrated : first the sound development over a period of time of the original work arrangement by the common sense, judgment and experience of traditional craftsmen ; then the " freezing " of this pattern in the face of a change in the language used ; and finally the redesign of the arrangement on the basis of scientific research to adjust the layout to man's capacities and limitations and to improve the product.

Under pressure of a constant speed-up in rate of change and as a contributor to that very acceleration, the process of industrial and technological development has been increasingly characterised by the contribution of scientific thinking—from the pioneering studies on working process efficiency carried out around the turn of the century by Frederick W. Taylor and Frank and Lilian Gilbreth, to the present elaborate work study techniques—i.e. the effort to make more effective use of all factors of production on the one hand and to render less arduous the conditions under which men contribute their labour to industry on the other.

In the course of the last century and a half, organisation of the workplace and of work study has gone through many phases. The early stage, primitive in many ways, was characterised by rough and ready methods, with attention quite naturally concentrated on getting the most out of the factors of production (including human labour), often totally disregarding the impact of these methods on the human beings concerned. Most of the entrepreneurs of the period violently resisted all efforts on the part of the workers or the utilitarian philosophers to mitigate the harm to workers' health and the danger to their lives whenever such changes seemed to threaten an increase in the cost of the operation.

From that early stage industrial society has come a long way. Management has become a highly skilled profession, accepting gradually a growing number of techniques as the economic advantages of a scientific approach to the problems of the workplace have become increasingly evident. In the course of this transformation from exploitation of the means of production to an increasingly responsible approach to their use, management has steadily come to recognise the positive advantages of many of the changes forced by labour and legislative pressure and has in turn incorporated welfare objectives into its own efficiency drives and technological development programmes. Thus, welfare practices introduced to make work safer, healthier, less repellent, less arduous or less monotonous have been found valuable by enlightened management in attaining its efficiency objectives.

The Improvement of Working Conditions

In order to understand the relationship between working conditions and the various measures which, throughout modern industrial development, have tended to change them for the better, let us consider the part played in the process by legislative measures (e.g. safety and health regulations), the application of the engineering sciences (and, more recently, the human biological sciences[1]), and a number of newer measures representing the most enlightened approach to industrial conditions and based on the wider contributions of the human sciences as a whole (and psychology in particular) in the field of mental health and human relations.

No dividing lines can be drawn to indicate exactly the areas in which these three groups of measures operate. In the first, however, where a high incidence of ill effects is associated with bad physical working conditions, the clinical signs are obvious and the cause and effect relationship easy to establish. This is the area usually controlled by legislation, where a relatively small outlay by the employer results in marked improvement, down to a level where the incidence of ill effects is generally accepted or where they are not immediately obvious.

In the area of the engineering sciences, where the group of disciplines known as ergonomics operates most notably, further decrease in the incidence of ill effects, accidents and disease by improvement in working conditions is not so marked for the same cost, and it has usually been possible to achieve this improvement only by drawing attention to the increases in productivity and efficiency which are likely to result from the adoption of appropriate measures or by appealing to the humanitarian instincts of employers.

The third area is the most difficult to define. The ill effects produced by certain unfavourable working conditions may only emerge at a late stage as a " stress disease ", or as an effect on mental health or on human relations often difficult to ascribe to the working environment and usually more of statistical than of individual clinical significance. Corrective action in this area will only be brought about through education and enlightenment or as refinements of methods of assessment reveal true causal relationships; the cost of introducing control methods is difficult to justify otherwise.

As an example let us consider the technical problem of noise abatement. Abundant medical evidence exists concerning occupa-

[1] In this context the human biological sciences are taken to mean anthropometry, physiology and psychology, whose contributions are discussed in more detail below.

tional deafness caused by continuous exposure to sounds above 80 decibels ; this is the lower limit of the first area of interest. Evidence also exists regarding the difficulties of communication and the lack of concentration resulting from continuous exposure to noise above 60 decibels and leading to accidents, mistakes and lowered productivity ; this is the lower limit of the second area. Less evidence exists regarding the effects of noise below 60 decibels, since in this third area they depend on the nature, duration and pattern of the noise, while the variability of individual response to noise also plays a part.

Methods of noise suppression may be different in different circumstances, but they all form part of the acoustic engineer's stock-in-trade. The same expert is therefore likely to be able to offer technical advice on noise control at both ends of the scale. This holds true for the contribution of machine designers, lighting engineers, air conditioning engineers and other specialists in relation to their respective fields of interest. However, it is the function of the human biological scientist to put into the hands of the engineer the data he needs if he is to know how and where his techniques can be used to the greatest effect.

At the present time, in many countries and in many branches of industry, a growing number of firms are establishing plants where safety and health and working conditions generally have reached a very high standard. The " welfare " attitude has changed from the traditional concern with such things as canteens, cloakrooms and transport facilities to a new and broader approach in which there is an intelligent application of a body of knowledge intended to facilitate the adaptation of the worker to his job and of the work environment to his needs and capacities. This knowledge in turn is provided by the investigations of the scientific disciplines concerned with the problems of man in relation to his work : experimental psychology, environmental and work physiology, industrial hygiene and toxicology, industrial medicine, anthropometry and the whole range of work study techniques. Ergonomics—the term now generally used to cover the application in industry of the findings of these various disciplines—is making it possible, in good conditions of safety, health and comfort, to combine and pursue successfully the twin objectives of higher productivity and greater well-being for the men and women engaged in industrial work.

At the same time growing attention is being paid to the mental health of workers, and efforts are being made to eliminate or modify those tasks which, in the long term, impose undue stresses on the capacity of the individual for adapting himself to the speed, intensity or responsibility of his work. This is a trend which shows promise of becoming increasingly important through the application

of automation to current industrial and commercial processes in order to replace them with tasks involving greater scope for the intelligence and a wider span of interest. Just as the improvement of working conditions has an effect on the human relations side of an industry, so the improvement of mental health by sociological techniques may have an effect in lowering accident rates.

The tendency towards humanising the workplace reflects a number of forces at work on the industrial scene : government action in imposing minimum standards ; pressures from organised labour for constant improvement in the working environment ; and a genuine concern by management, motivated by a straightforward interest in efficiency as well as by a sounder recognition of the individual as a person, to eliminate every identifiable cause which tends to reduce the efficiency of the worker, while at the same time seeking to develop in him a sense of genuine satisfaction with his job and a positive interest in his working relations. Whenever this interplay of interests and objectives is recognised to exist in fact and its achievement is facilitated by the effective application of the findings of the human biological sciences, ergonomics may truly be said to promote both labour productivity and worker well-being.

The improvement of working conditions is not only a question for the laboratory and the measuring instrument. The lessons which have already been learnt are capable of being applied in all industries, in plants both large and small. The difficulty is that the expert who is most deeply concerned with these problems tends to confine himself to the laboratory and is unfortunately not brought into direct contact with the large number of medium and small factories where a host of problems can be solved by a few moments' practical study and usually at fairly small cost.

On the other hand the average small industrialist often does not have the time or the attitude of mind to devote himself to the human aspects of the work his employees are doing. The occasional presence in his factory of a man trained to observe these problems —for example the trained labour inspector—acts as a stimulus and opens the door to improvements not only in working conditions but also ultimately in over-all efficiency.

This description is necessarily oversimplified. It is evident, for instance, that much methods study work, although primarily concerned with increasing productivity, has also had a considerable effect in improving conditions at the workplace, making work easier, environmental conditions healthier, safer and more comfortable. Similarly, the findings of the behavioural and biological sciences, although their application is primarily concerned with making the conditions under which people work healthier, both in a physical and a moral sense, have made an important contribution

to improving output. Finally, management techniques themselves owe a great deal to the information provided by research in the human sciences. Indeed, if ergonomic principles are to be fully effective in their application in all industrial sectors, work study concepts and techniques will need to be re-examined closely in the light of the findings of this new discipline.

The Genesis of Ergonomics

Although the modification of industrial processes to make them more efficient, the improvement of working conditions and the removal of health and safety hazards, have been going on for as long as the industrial process itself, the new applied science of ergonomics stands out for its fresh approach and the combination of techniques it involves.

The growth of industry during the last 200 years, whilst it has made men increasingly dependent on the machine, has helped them achieve a higher standard of living and given them an increasing measure of control over their environment ; it has also, until the fairly recent past, brought hardships and suffering to workers. From the time when the first textile factories were built, industrial structures and machines have tended to be conceived with an eye to the process rather than the man who operates it. Man in consequence has lost the central place in production which he occupied as a craftsman. He has become increasingly the servant of the machine, tied to its inexorable rhythm. The development of the machine itself has reached a point where it is no longer the limiting factor in the speed of production and this in turn has been imposing increasing stresses and strains on the operator.

These effects had begun to be obvious more than 50 years ago when, for instance, the low standard of recruits to the British Army was recognised to be a result of a number of factors, of which the poor nutrition of industrial workers and the conditions under which they worked were among the most important. But developments and scientific investigation were slow and the efforts to combine the man-machine complex more successfully were directed principally to improving productivity. Awareness of the need to pay equal attention to the human factor in industry developed only very gradually.

It took the experience of two world wars to stimulate any positive action. Wars have always added to our knowledge of human performance under stress, but it was not until the First World War that attempts were made to investigate human performance in industry and scientific investigations were made into the relationship of working conditions to health. For instance

concern about fatigue in munitions factories in the United Kingdom led to the establishment of the Industrial Fatigue Research Board, under whose auspices physiologists and psychologists conducted a number of investigations into the effect of working conditions on health and efficiency. These valuable pioneering studies, however, had relatively little impact on industry in the twenties and thirties and progress was slow, possibly because a general labour surplus removed the demand for economy in labour.

The Second World War gave great impetus to the study of human performance, because the extreme demands that were placed upon responsible personnel led to difficulties in the control and operation of radar, anti-aircraft tracking systems, high speed aircraft and other intricate military equipment. The complexity of these devices, the need for effective design of operations plotting rooms and for the development of suitable clothing for extreme weather conditions, the establishment of design criteria to satisfy the human requirements of tank drivers for protection, visibility and efficiency, and similar problems, all emphasised that technical developments had reached the stage at which the capacities of the operator rather than the potentialities of his equipment were setting limits to the performance of men and machines working together. If further progress was to be made it was therefore necessary that these human limits should be studied and that equipment should be designed in relation to them.

Furthermore, during the last decade especially, technological developments in industry, often associated with the concept of automation [1], have with increasing frequency resulted in the construction of machines which threaten to make excessive demands on their human operators ; some of these have, on occasion, turned out to be too complex for a man to control effectively, or so rapid that to keep pace with them he must exceed his normal endurance limits. In consequence, ergonomists have more and more often been called on to make their findings available as a guide to design engineers. It was thus that " human engineering ", or ergonomics, first came into prominence.

While some applications of the human biological sciences had been made to the design of machines and the conduct of industrial operations before the war, the wartime and post-war research laid emphasis on three points. Firstly, it aimed at designing equipment to ensure that its operation was within the limits of human capacity, instead of trying by selection and training to match men to the demands of particular tasks. Secondly, the fact was recognised that

[1] See " Automation : Some Social Aspects ", in *International Labour Review*, Vol. LXXII, No. 6, Dec. 1955, pp. 467 ff.

the problems of application should be tackled in terms of fundamental principles. Thirdly, the essential interdependence of functional anatomy, physiology and experimental psychology became very clear, and the need was stressed for close and sustained co-operation among research workers in these disciplines, and between them and the engineers who were responsible for the design of machines and processes, as well as the worker responsible for their operation.

In the United States, where the initial impetus had come largely from the demands of the armed forces, the principal areas of study have until recently been those concerning the effects of high stresses of short duration on young, physically fit men. In Europe research has been more particularly directed towards the solution of industrial problems, as typified by the studies undertaken by experimental psychologists in the United Kingdom and by work physiologists in the Federal Republic of Germany and Sweden in particular.

The first integration of the technical and biological sciences into a unified attack on the human problems of work occurred in the United Kingdom with the formation in 1949 of the Ergonomics Research Society, which introduced the term. In the United States there are now two professional organisations directly concerned with these problems—the Society of Engineering Psychologists (a division of the American Psychological Association) and the Human Factors Society. This growing interest led to the organisation in 1955 of a study project under the sponsorship of the European Productivity Agency, the final objective of which was to convene a tripartite international conference at which scientists and technicians could present to representatives of employers and workers from a number of European countries the contributions from their respective fields to this new approach and the practical results which had been achieved in adapting work and the working environment to man.[1]

At this Conference the following subjects were discussed:

1. *Heavy muscular work.* Physiological limits of human muscular action; optimum energy expenditure per unit of time; effect of climatic conditions and rest pauses on human performance.

2. *Anatomical factors in the layout of the workplace.* Correct design of the workplace, including the design of workbenches and seats; arrangement of the task (components and equipment) in the light of studies of human body measurements.

3. *Presentation and use of information from the work process.* Layout and presentation of all types of indicating devices and instrument display panels to facilitate accurate perception and to indicate the appropriate action within the limits of human psychological capacity.

[1] The Conference was held in Zürich in 1959 (see below).

4. *Design of controls.* Design, position and direction of movement of control devices (levers, wheels, etc.), so that the action taken by the operator is in accordance with normal human mental and physical characteristics.

5. *Lighting.* Provision of good lighting from the point of view of workers' comfort, efficiency and safety.

6. *Noise.* Control of noise levels from the point of view of damage to hearing, psychological effect of noise and interference with effective communication on the job.

7. *Climatic conditions at the workplace.* Effect of extremes of temperature and humidity on the working capacity and the need for rest pauses, and methods for the control of such environmental conditions.

8. *Biological factors in the arrangement of working periods.* Factors influencing fatigue, such as duration and intensity of the working spell, frequency and duration of rest pauses and effect of shift work.

These problems and the contributions of the biological sciences to their solution will be discussed in some detail in the following pages.

The Human Biological Sciences and Their Application in Industry

The essence of science is measurement. Any scientist confronted with a problem breaks it down to its fundamentals in terms of action and reaction, measures these and interprets the problem by reconstructing it in terms of measured quantities. The biological sciences are no exception in their study of man at work. The action (or stimulus), in this case the industrial environment, can be measured in a variety of units—degrees, decibels, lux, relative humidity, etc.—while the reaction, that is the human response, can be measured either in absolute terms such as body temperature, pulse rate, reaction time or oxygen consumption, or by statistical indices such as output, errors, frequency or severity rates of accidents, sickness and absence rates, and so on.

In any investigation the object of the scientist is so to arrange the experiment that he can isolate the effect of the particular factor in which he is interested. The more detailed his measuring instrument or the more refined his technique, the more sure he can be that the effects he is investigating are attributable to a particular action or that a particular action produces a certain effect. This is difficult enough in most scientific fields, but in the area with which we are concerned, where the dependence of one factor on another is of such paramount importance, the difficulties are considerable. While many different techniques can be used to measure a variety of reactions in the human being, it must never be forgotten that we are dealing with a whole person, a compound of physical, chemical and above all emotional reactions and a creature of bewildering variation

and adaptability. Nevertheless the influence of environmental factors on the individual can be measured with considerable accuracy, and refinements of instrumentation and technique are constantly improving the reliability of the results obtained; however, the final answer can never be more than an approximation, frequently open to a number of interpretations, and representing the middle of a range with often wide extremes.

The difficulties of investigating a problem are no excuse for avoiding it and, in order to provide the architect, the machine designer, or the heating, lighting and ventilation engineer with the information necessary to enable him to design or modify the working environment, the human biological scientist, using a wide variety of skills and techniques, must continue to study the reactions of man to the many and varied influences of his surroundings. Not only must he study them but he must compare his results with those of other scientists in related fields, so that, in this area perhaps even more than in any other, team work is essential. Nor can the human biological scientist work in isolation from the engineer, the employer and the worker. All have something to contribute to the understanding of man in relation to his working environment.

As has already been mentioned, the main scientific disciplines concerned with fitting the job to the worker are anthropometry, physiology and psychology. The contributions of these three sciences to ergonomics cannot be rigorously separated in all cases, and in the sections that follow the reader must expect to encounter some overlapping of one subject with another.

Anthropometry

The human body is a remarkable piece of engineering. Its arrangement of levers, hinges and joints, governed by a self-contained computer system, able to operate independently in an infinite variety of circumstances and to decide for itself how a job should be tackled, makes it unique among machines. The study of the essential features of the design of man which are important in designing the equipment with which he works is known as anthropometry. It is concerned with measuring the dimensions of the various parts of the body such as height, weight, arm reach, shoulder height and ratio of leg to trunk length, taking account of the range of variation of individuals around the average; it also deals with the operation of the various muscular levers and investigates the forces which can be applied in various positions by different groups of muscles. Some muscles, for example those of the back and the thighs, are bulky and strong, and can exert considerable force without becoming rapidly tired. Others, such as the tiny

muscles of the hand, are capable of very rapid and very specialised movement, though they cannot exert the force of the larger muscles. Certain muscles can operate better when the subject is in the standing position and others when he is sitting ; the arms, for instance, can apply force more effectively at shoulder level when a man is in the standing position, while they operate better at elbow level when he is seated.

Numerous laboratory experiments have investigated the forces that can be exerted by different groups of muscles in different positions and have established the limiting factors ; a number of publications are available specifying these forces. Apart from simple arrangements of weights and pulleys, intruments used for investigating the forces exerted or the strain on muscles include the dynamometer, which measures mechanical forces directly, and the electromyograph, which measures the electrical impulses associated with the contraction of muscles.

Anatomical Factors in Work Design.

Time and motion study has been concerned with anatomical factors without perhaps being fully aware of the scientific help that anthropometry can give. Much of the work has been done on the basis of common sense ; but this is not quite enough, as the possibility of undue strain on muscle groups may not be apparent during the initial trial period unless appropriate scientific tests are conducted.

In too many cases the reasoning of the designer is in terms of the function of the machine, that of the manufacturer in terms of the stresses on the components and that of the employer in terms of its theoretical output, rather than in terms of the function, stresses or output of the man who will use it.

In the design of equipment and processes the position of the switches, knobs, cranks, pedals, gear levers or items of assembly needs to be considered in relation to the working position of the operator and his capacities of strength and reach. One of the important functions of the anthropometrist, and the one which most frequently calls for his special knowledge, is the design of seating for various industrial purposes. A different form of seat is required for the typist, the aircraft pilot, the bus driver, the draughtsman, and the executive. The whole question of the design of cabs for various purposes—railway engines, buses, bulldozers, cranes, etc.—involves a study of the relationship of the operator to the controls, and of his unobstructed view of the working area. Similarly, in the design of staircases, the special circumstances of their use, correlated with the average physical dimensions of the persons using them, will determine the width of the treads and the

height of the risers. The design of ladders and the width and height of shelves depend upon the same considerations. Tables are available giving the mean measurements of individuals in different countries and indicating the range of variation around this mean.

Anthropometry, however, is not only concerned with working positions and the static loads that muscles are called upon to bear. The manual handling of goods, which will always be necessary in certain circumstances, involves lifting and carrying, and a great deal of study has gone into the question of what is called " kinetic handling ". This considers the proper approach to lifting the object to be carried, keeping in mind the optimum position of the body for weight-bearing and the direction in which the load has to be carried. Workers can be taught, for example, to use the load itself as a cantilever in order to ease their lifting effort, and the considerable degree of skill which a man can be trained to develop by this system in handling sacks, drums, cases and other heavy or cumbersome packages, either individually or as a member of a team, is an indication of the advantages to be gained by applying scientific knowledge to what may appear to be obvious tasks.

Physiology

While a man may be proud of his physical strength and may delight in demonstrating his prowess as a lumberjack or a docker, he cannot compete in efficiency with the new mechanical methods of tree felling and handling or with a pneumatic unloader in emptying a grain ship. Mechanical methods are being used to an ever greater extent, and there is little doubt that they will ultimately supplant hard physical work generally, much of which is now recognised as unnecessary and uneconomic. Muscle power, however, will still be necessary in many cases, and it is therefore essential for those concerned with organising and supervising work to have a clear idea of man's capacities in this respect.

The function of the human body can be likened to that of a machine in terms of fuel supply, combustion, energy, output and waste disposal.

But this machine, like all others, has its limitations. The fuel must be adequate in quantity as well as in quality, oxygen must be delivered in amounts appropriate to the immediate needs, the waste products must be removed and the heat dissipated. Insufficient or poorly balanced food, insufficient oxygen in the air or inadequate gas exchange in the lungs, overstrain or inefficiency of the heart, incapacity of the blood to carry its full quota of oxygen, inefficient use of the fuel by the cells, faults in waste disposal (either in the cells or in the kidneys or lungs), or inability of the system to eliminate heat sufficiently rapidly—all these are limiting factors on

the amount of work the body can perform, which vary in degree and depend not only on the state of physical fitness of the individual concerned but on the environmental conditions.

Two important and related considerations must also be mentioned—the adaptability of the body and its reserves. We seldom need to call upon the limits of our muscular strength, the maximum breathing effort of which our lungs are capable, the maximum pumping action of the heart or the maximum cooling capacity of the skin. Rarely needed, they nevertheless confer upon man his capacity to adapt to extremes of temperature and to the many other stresses of his environment. The existence of this faculty of adaptability often masks the danger of encroaching upon the body's reserves (which naturally vary greatly from one person to another). They are gradually depleted by advancing age, disease or chronic fatigue, but we are seldom aware of the extent of the depletion until a special effort is called for, when we may find that the former ability no longer exists.

Heat Stress.

Muscular work produces heat, but, because it is essential for the optimum function of the body that its temperature be maintained constant at 98.4° Fahrenheit, any excess heat produced must be lost. Various methods are adopted by the body for this purpose ; the vessels of the skin dilate and the skin is therefore able to radiate more heat to the environment ; water vapour expelled by the lungs carries with it a certain amount of heat ; however, the principal method of heat loss is by the evaporation, perceptible or imperceptible, of the sweat. One of the special properties of water is its very high latent heat of vaporisation. To convert 1 gram of water into vapour requires 540 calories. This makes sweating a very efficient agent for extracting heat from the body ; the amount of evaporation from the surface of the skin is often as much as 2 litres in the course of an eight-hour working spell, representing a heat loss of 1,000 kilocalories (or " large " calories, each equal to 1,000 " small " calories). In order to provide the sweat glands with water for evaporation, the skin vessels expand to increase the blood flow ; by itself this creates no problem, but if the circulation is also being called upon to provide blood to the muscles in order to enable them to carry out heavy physical work, something must be sacrificed, either heat regulation or working capacity, or sometimes both. Experiments have shown that the physiological workload for a given amount of work can vary considerably in different environmental conditions and that a job which a man can do easily for a long time in a cool, dry environment rapidly exhausts him if the environment is hot and moist.

The special danger of a hot, moist environment results from the fact that moist air will take up only a limited amount of water before becoming saturated. At full saturation, i.e. with a relative humidity of 100 per cent., no more water can be evaporated from the surface of the skin, with the result that the body fails to lose heat and the internal temperature rises. With sufficient air movement the area of moist air surrounding the body is readily removed, allowing less saturated air to take its place, but in the absence of air movement exhaustion can come on rapidly. The body may absorb heat by radiation from its surroundings and, in the case of a furnace, the heat gain from this factor may be considerable. When the body is unable to maintain its internal temperature at a constant level, the various phenomena of heat stress become evident.

Many devices and indices exist to measure the heat stress of the environment : the ordinary thermometer gives an over-all indication of temperature, the wet and dry bulb thermometer gives an indication of the relative humidity of the atmosphere, the globe thermometer gives a measurement of the radiant temperature of the environment, while the kata thermometer gives an indication of the air speed and consequently the cooling power of the environment. No instrument yet devised, however, will give a proper index of comfort, which depends upon the integration of all the above factors in various ways. The nearest approach to an integrated value is the "corrected effective temperature", an index which includes the temperature, humidity, radiant temperature and cooling power of the air in a single figure.[1]

Many different methods exist for controlling heat stress—radiation from the environment can be prevented by providing reflecting barriers; special aluminised clothing may be worn by workers in jobs involving inevitable exposure to radiant heat such as at furnaces; air conditioning apparatus can be installed to control temperature and humidity; and in certain cases cold blasts of air can be directed at the working station.

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[1] Perhaps the best-known index of heat stress is that developed by Belding and Hatch, by which the various factors responsible for heat gain and heat loss are expressed in the form of an equation which should ideally give a value of zero. Each of the above-mentioned factors, together with the internal temperature of the body and the sweat rate, are included in the equation. By means of this index the maximum allowable working time under given conditions of heat and humidity and the amount of rest necessary to re-establish thermal equilibrium can be calculated. Criteria are still somewhat arbitrary, and more physiological research will be necessary before definite standards can be established for the guidance of management, but knowledge is rapidly increasing and much of it can already be usefully applied. See H. S. BELDING and T. F. HATCH : " Index for Evaluating Heat Stress in Terms of Resulting Physiological Strains ", in *Heating, Piping and Air Conditioning*, Aug. 1955, p. 129.

The Special Senses.

The object of the sensory apparatus of man—including, for example, vision, hearing, smell, touch and the muscle-joint sense (i.e. the sense which indicates the position of limbs and the pull of muscles)—is to keep him informed of his relationship to his environment. Only when he is asleep is this sensory apparatus temporarily suspended, and even then it is ready to be awakened at the threat of danger. Each sense has a corollary in the environment ; thus vision is related to lighting, hearing to sound, taste and smell to the chemistry of the environment, touch to texture and the muscle-joint sense to pressure and gravity.

The sense organs are extremely complex, and it is not necessary here to go into the details of their structure or function. Their essential features will emerge in the discussion of the effect of the environment on them.

Noise.

As machines become larger, faster and ever more numerous, noise increases, and it is now ranked with air pollution as one of the major nuisances of civilisation. Noise is defined as unwanted sound, and this definition illustrates its subjective nature. A loud bang in the desert is not a noise unless there is someone to hear it.

Sound is a form of energy moving in alternate bands of compression and rarefaction in a physical medium, usually air, its speed varying according to the density of this medium. The characteristics of a pure sound are its pitch (measured in vibrations per second ; e.g. middle C on the piano is 256 vibrations per second) and its intensity (measured in decibels or phones ; the noise in a typing office is around 60 decibels, that of a noisy workshop, 80 decibels, and that of a jet plane may be as high as 150 decibels). Most sounds, however, are not pure but are made up of several different frequencies and intensities.

Apart from the complex variations of pitch and intensity which constitute sound, other features which must be considered are its duration, regularity and pattern. Further points to be remembered are that sound, like other forms of energy, obeys the inverse square law (i.e. a doubling of the distance from the source reduces the intensity by four times and a trebling of the distance reduces it by nine times) and that it may also be reflected from hard surfaces. In a confined space this leads to a build-up in the sound level by reverberation.

A sense of hearing is essential for a proper appreciation of the environment. It can be very highly developed to detect, for example, minor changes in the running of a machine and, sometimes in advance of other senses, to warn of malfunction or approaching

danger. It is the last sense to disappear before we go to sleep and the first to reappear when we awake. Valuable as it is, however, it cannot be switched off at will ; but most people can adapt within a short time even to very loud sounds, provided they remain constant.

A high level of noise can interfere with speech communication, and failure to understand instructions fully or to hear a warning can have expensive or dangerous consequences. For this reason alone it is desirable to reduce noise in industry to a level which makes communication easy. There is also evidence that high noise levels can influence the quality of performance.

At extreme levels of intensity actual physical damage can be done to the ear. The firing of a cannon produces a noise near the gun in the region of 175 decibels, which can cause immediate pain in the ear or even rupture of the eardrum. At levels above 80 decibels, depending on the duration of the exposure and to some extent on the intrinsic content of the sound (its proportion of high frequencies for example), the function of the inner ear can be damaged. If exposure is of short duration recovery takes place, but if it is continued the effect can become permanent, and deafness, which in the beginning may be localised to a narrow range of frequency, increases progressively.

The classic example of occupational deafness is that of the boiler-maker who operates a riveting machine, often inside the enclosed metallic shell of a boiler. Many boiler-makers become deaf; they may not necessarily be deaf to all sounds at first, but the tendency is for the deafness in one limited range of frequencies to spread progressively over the whole range of hearing. Deafness does not always interfere with efficiency, but it represents a serious loss of contact with the outside world, and loss of hearing as a result of work is the object of compensation legislation in a number of countries.

There are many ways of controlling noise. The most effective is to replace a noisy process with a quieter one ; for example pressings can in some instances take the place of forgings. The redesign of machines to enclose the noisy parts or the substitution of nylon gears for metal ones is also effective. Noise insulation panelling on the walls or on baffles hung from the ceiling can be used with advantage in many circumstances where the noise source cannot be reduced ; or noisy processes can be segregated from areas where people are working. Finally, where work must by its very nature be done under extremely noisy conditions—for example the testing of jet engines, the servicing of noisy machinery or in boiler-making—individual protection can be provided by means of ear muffs or plugs.

Vibration.

Although noise is the commonest manifestation of environmental vibration, many hand tools such as pneumatic hammers, chisels and grinders expose the worker to the harmful effects of vibration detected through the bones and muscles. In some cases the source of the vibration is not a hand tool but the article being manufactured. This happens in grinding metallic components on stand-grinders or in using pounding (" pouncing ") machines in the boot and shoe industry.

The main effect of vibrations is to upset the nervous control of the small arteries, thus giving rise, in the case of the hands, to " dead hand ", a condition in which the fingers become white and there is tingling and loss of sensation. Other after effects of exposure to vibrations, for example among railway engine drivers or air crew, have been suggested, but information in this field is very meagre and little direct evidence of damage to health has so far been produced.

Vision.

The eye and the nerve endings on the retina are so constructed as to form a delicate and sensitive mechanism which functions effectively in a wide range of conditions. Vision depends on four fundamental external factors—the size of the object of interest, the brightness of its surroundings, the contrast between the object and its surroundings, and the duration of observation. These are all interdependent and each visual task should be carefully assessed to balance out the factors in the best interests of the comfort and efficiency of the operator.

Thus the size of a figure on a dial or the thickness of a pointer should be carefully considered with regard to the position of the observer and the accuracy of reading demanded by the task. Where accuracy of reading is critical, pointers should be so designed as to avoid the effect of parallax, as a result of which, depending on the difference between the plane of the pointer and that of the scale coupled with the angle of observation, the true position of the pointer may be different from its observed position.

The brightness of the surroundings is important in a number of inspection tasks, among the most demanding of which is the examination and repair of faults in dark-coloured cloth ; lack of reflection from the background demands a high level of incident light. Problems of contrast also arise frequently in inspection tasks ; as an illustration it is sufficient to compare the task of reading pencil notes on dark-coloured paper with that of reading bold type on white paper.

If the exigencies of the job demand effective action on a signal observed only momentarily, the possibility of error is naturally increased. The duration of the signal should be such that the operator has ample time to take the appropriate action.

It must be re-emphasised that all these factors are interdependent and that deficiencies in one can, in many cases, be counterbalanced by improvements in another. Each visual task should be evaluated on its merits, giving full consideration to the needs of the individual as well as the process.

Depth Perception.

As a result of the mental analysis and synthesis of a complicated array of visual data from the two eyes, it is possible to estimate the relative distances of objects. The importance of this function from the point of view of safety or efficiency cannot be overestimated, but it is obviously more critical in some tasks than others. Two examples of jobs requiring a high standard of depth perception are those of the crane operator and the airline pilot.

Lighting.

Diffuse lighting, of which daylight is the best example, is generally speaking better than any form of artificial light ; but the necessary intensity of illumination in the case of the latter depends on whether the task demands acute concentrated work, general observation or background vision. Scales of recommended intensities for various tasks are provided in many national codes of legislation.

The nature of the artificial light source is of great importance in many instances. As a general rule, because of their diffused light, fluorescent tubes are to be preferred to filament lamps, although care must be taken to make their colour simulate daylight as closely as possible and also to avoid the stroboscopic effect, which arises when their intrinsic flicker, although undetectable to the normal eye, creates disturbances of illumination of rapidly moving objects such as the spokes of a wheel, to the extent of making them appear to be stationary or to rotate backwards or at less than their actual speed. This can be avoided by the introduction of three-phase fluorescent lighting.

Another important factor is glare, which may be either direct or indirect. A source of light within the normal field of vision of the operator produces direct glare which dazzles the eyes, interferes with the accommodation of the eye to the work, and results in visual fatigue and errors. In the case of indirect glare the reflection of light sources from polished surfaces (or, for example in the case of the car driver, from a wet road surface) produces similar effects.

Psychology

Just as the anthropometrist and the physiologist have a distinctive contribution to make towards adapting man's working environment to his anatomical and physiological needs, so has the psychologist in respect of man's psychological needs. Psychology attempts to define these needs, so as to be able to state the psychological requirements for satisfying and productive work.

Apart from the pre-requisite of fair wages, a worker often attaches most importance, among the factors that play the largest part in making his work worth while, to the feeling of having done a good job, to the satisfaction derived from having proper recognition of his work, to his pleasant relations with his colleagues, and so on. Social considerations of this kind play a central role in " making work human ". Although they form a major area of study for the psychologist—in particular the " industrial psychologist " and the " social psychologist "—they will not, however, be given more than passing mention here. This is solely because the psychologist who normally works as one of an ergonomics team is primarily an " experimental psychologist " or " laboratory psychologist ", whose interests are focused on the theory and observation of behaviour in a strictly individual sense.

The experimental psychologist may be described as one who uses the methods of science to study the responses of individuals in prescribed conditions. His field of study ranges from questions such as reaction time (that is, the interval that elapses between the presentation of a stimulus and the required response to it) and memory, questions which have been studied experimentally since the nineteenth century, to the present-day analyses of complex skills and the use of information theory (that is, a mathematical theory of the behaviour of communication systems) in investigating perceptual processes. He is concerned with psychological needs in the narrower sense of ensuring that the nature of the job is commensurate with the mental capacities of the operator.

It was often said of industrial psychology, before the social factors affecting work performance and satisfaction were fully appreciated, that it consisted jointly of " fitting the job to the man " and " fitting the man to the job ". The study of the latter in vocational guidance and personnel selection led to a broadly based knowledge of the extent and limitations of human abilities. Such knowledge may be fruitfully applied in specific work situations.

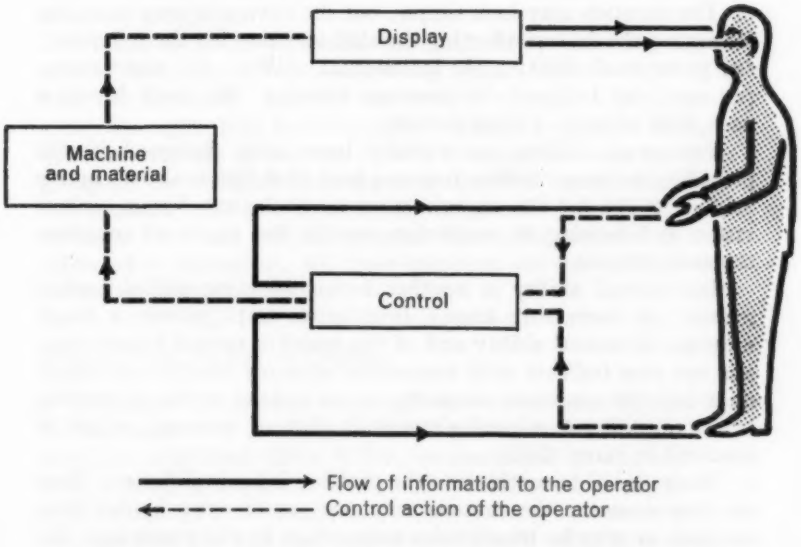
The contributions of psychology towards making work human are thus varied and extensive. In the paragraphs which follow, we shall consider some of the principal fields of activity at the present time.

Neuro-muscular Co-ordination.

Any combination of stimuli presented to the worker at the same time through his sense organs is referred to as a " display ". Displays can be auditory, visual, tactile, kinesthetic or a combination of two or more of these. Thus external signals from the environment, such as sight or sound, are not the only elements of the display ; the feel of the controls (e.g. the pressure on a lever) is often a source of information to the operator. The design of controls on the basis of the interplay of all these factors, using the information provided by research in experimental psychology, can often make possible increased speed of work, with less effort, improvement in the quality of the product, as well as reduction in training time of the worker and increased safety of operation.

The relationship between the display and the reaction is of considerable importance in a number of industrial situations ; as far as possible the indicators and controls of a machine or process should be so designed as to be an extension of the neuro-muscular system of the worker. The accompanying diagram illustrates this relationship.

PATHS OF INFORMATION



Source : Organisation for European Economic Co-operation, European Productivity Agency : *Fitting the Job to the Worker : International Conference of Zürich, 2-6 March 1959.* General report by Bernard METZ. (Project No. 6/07E) (Paris, 1960).

In particular there should be an essential harmony in the controls of all machines so that movements are natural and do not conflict with the worker's habits and experience of similar situations, i.e. stereotyped reactions. Thus, wheel controls should be so arranged that a clockwise motion produces a clockwise or a right-hand turn of the controlled mechanism ; levers should be designed so that a forward movement is associated with the expected downward, advancing or accelerating movement of the device or machine ; while a backward movement should be associated with a lifting or braking action. Even in the design of stopcocks and taps there should be standardisation so that they always turn anti-clockwise for " on " and clockwise for " off ". Although these remarks may appear to be more than self-evident, cases have been described in which accidents have occurred, on bulldozers and cutting tools for example, where the controls were so arranged that the effect was opposite to that normally expected. Thus, it can truly be said that a machine's " accident proneness " points to a fundamental error in its design.

Nature of Skilled Performance.

It has been suggested that the expert operator differs from the ordinary one because of his timing. But how does the operator time his performance ?

The question may look simple, but the answer is very complex, for among the factors affecting the skill one may list the following : *(a)* perceptual ability ; *(b)* intellectual ability ; *(c)* motivation ; *(d)* age ; *(e)* fatigue ; *(f)* previous training. We shall devote a paragraph to each of these factors.

Perceptual ability has already been fully discussed in the preceding sections. Suffice it to say here that this is also an active field of study for the experimental psychologist. Vision, colour vision and hearing in particular provide the topics of countless research projects.

Intellectual ability is another factor affecting skilled performance. As everybody knows, intelligence tests provide a rough measure of mental ability and of the speed of mental functioning, and can now indicate with reasonable accuracy whether an individual has the necessary capacity to undertake work at varying levels of skill. A related element is that of memory, which is involved in many skills.

With regard to motivation the problem is again different. Here we may examine the reasons why one person tries harder than another, or why he tries harder today than he did yesterday. We may study his ability to concentrate, for example, at a task involving continuous inspection in which errors are introduced at very

infrequent intervals, and we may see how this ability varies if we speak to him during the experiment or leave him completely alone, or if we reward him for every error he spots, and so on.

Aging is another factor which has been extensively studied in post-war years because of the obvious importance of retraining older people and keeping them longer in employment. Whilst it is obvious that some changes take place with increasing age, research shows, for example, that the degree to which the individual can use a free choice of method and timing will be an important factor in determining whether age differences occur. This finding is typical of many experimental studies.

It is also common sense that fatigue can cause the breakdown of a skill. In the early days of psychology this was studied by simple experiments involving the lifting of weights by one finger, which continued until the muscle or group of muscles was exhausted. Today the experiments are more sophisticated. Perhaps the best known are the studies of the "Cambridge Cockpit", which was specially designed to measure the kinds of deterioration that occurred in pilot performance after increasing periods of time. Here it could be shown how the complex skill of flying breaks down under conditions of fatigue in quite a different way from that of a simple muscle ; how, for example, the pilot is more likely to make the right response at the wrong time than to make the wrong kind of response altogether.

Finally there are, of course, the effects of previous training. The trained operator—other things being equal—will be more skilled than the untrained. But will the operator with one hour of training a day for eight days be more skilled than the operator with eight hours of training in one day ? Will the operator who learns in a group be more skilled than the operator who learns alone ? Will the operator who is systematically informed of his results under training have any advantage over his colleague who is not so informed ? And so on. All these questions are the province of the industrial psychologist.

Psychological Factors in Lighting.

Reference has already been made in the section on physiology to the importance of daylight ; but in addition to the advantages of daylight mentioned there, it has an emotional quality associated with feelings of freedom. While little evidence exists of physical or mental damage or of diminished output among workers in windowless factories, the fact that a number of people suffer from claustrophobia is an objection which must be borne in mind by the designer of factory premises.

Questions of lighting are inseparable from those of colour. The manifold uses of colour in industry form a complex subject on which a great deal of research has been done. The choice and standardisation of colours as indicators or warning signs improves maintenance, promotes safety and prevents errors. The use of colour in the general industrial environment can improve illumination, brighten up the appearance of a workplace and foster morale.

Fatigue.

The effect of fatigue on skilled performance has already been discussed, but fatigue can take many forms and affect various bodily functions. It may take the form of visual fatigue, for example, or that of muscular and nervous fatigue generally.

Visual fatigue is closely linked with emotional factors, and it is consequently difficult to disentangle in a particular case the physical from the mental aspects. The delicate movements of the eyeballs align each eye correctly with the object under inspection, and the even more delicate movements of the intrinsic muscles of the eyeball which enable the iris to contract and the lens to accommodate to near or far objects can, in conditions of stress, result in fatigue just as the rapid movements of the small muscles in the hand over too long a period can lead to cramps. Under extreme conditions of work in poor light, such as was formerly performed by coal miners and train despatchers, a condition called nystagmus develops in which the eyeballs oscillate and vision becomes disorientated.

It is fairly easy to draw a distinction between muscular fatigue and nervous fatigue, although the former can influence the latter. The sensation of fatigue is not disagreeable provided one can relax, but it becomes increasingly unpleasant to the point of torture if there is no opportunity for relief. In the case of muscular fatigue the period of relaxation enables the waste materials of metabolism to be removed from the muscles, and as the efficiency of the muscles improves with exercise the removal of waste products becomes more efficient. In the case of nervous fatigue the chemical processes involved are not so clearly understood, but a recovery time is just as essential for nerve cells as for muscle cells.

The ultimate form of relaxation, of course, is sleep, but the opportunity to recover is not only a question of sleep. Even an active organ like the heart rests for more than half of its working time, and no matter how strenuous a man's job may be he can and does take rests. The capacity to relax is often an indication of skill and confidence, and it is fascinating to watch how the really skilled worker can relieve some of the strain of the work by relaxing

at appropriate times. Much muscular and mental potential is wasted by unnecessary tension.

Nervous fatigue affects all automatic and higher nervous functions. Its effects include—(1) a slowing down in the transmission of nervous impulses leading to an increase in reaction time ; (2) a falling-off in attention or concentration, which can lead to accidents ; (3) a lowering of intellectual capacity, involving difficulty in maintaining a high level of intellectual work ; (4) a reduction of sensory perception in that stimuli are not perceived as acutely or accurately as they should be [1] ; (5) increased irritability, tendency to depression, fear, lack of initiative, etc.

Chronic nervous fatigue presents the same mental manifestations and, in addition, tends to be associated with a number of functional disorders of the autonomic nervous system, such as insomnia, circulatory disturbances, palpitations, flushes, headaches, giddiness, loss of appetite and indigestion.

Nervous fatigue can arise from various different and unrelated causes, singly or in combination, of which the following are examples : (1) work requiring exceptional efforts of concentration, sensory perception and skill ; (2) any long sustained physical or mental effort ; (3) repetitive work in monotonous surroundings ; (4) hot, humid, noisy or badly illuminated working environment.

It must be stressed that there is a very large emotional element in fatigue, and it is a matter of common experience that the feeling of fatigue can disappear when the surroundings are changed, when the emotions of fear, love, hate or joy are aroused or when a change of activity reawakens interest. For the best results and the greatest satisfaction it is essential that the work should have and retain character and stimulation.

Rest.

In all forms of industrial or commercial work suitable rest periods must be provided. These help to reduce fatigue, avoid boredom, decrease accidents and generally improve morale. Where organised rest pauses are not officially provided the workers tend to take involuntary or disguised rests, which do not provide as satisfactory relaxation as properly organised rest periods. Generally speaking, the heavier the workload the greater should be the ratio of rest to effort and the rest periods should be few but long. On the other hand, the lighter the work or the higher the speed of work, the more frequent and short are the periods needed. Each particular task must be treated on its merits ; for example, where men are

[1] One of the common tests of mental fatigue is the flicker fusion frequency test which measures the point at which a flickering light appears to become steady.

exposed to heat stress, it should be arranged that their rest periods are taken in an environment which allows the internal temperature of the bodies to return to normal at an appropriate rate. In this field of study there is still great difference of opinion and much experimental work remains to be done on the relationship between the length of pauses and the daily performance, and the influence of the pauses on performance.

Action to Promote the Application of Ergonomics

Now that the various human biological sciences have been considered in terms of the individual contributions that several scientific disciplines can make to ergonomics, it will be useful to examine what is being done to further the practical application of this new technique.

National Activities

The research programme already referred to, which was launched by the European Productivity Agency in 1955 and culminated in the International Conference on " Fitting the Job to the Worker " which met in Zürich in 1959, has sparked off many national and international activities.

Reports on the E.P.A. Conference and its major conclusions, and articles on various ergonomic topics, have appeared in many national technical reviews as well as in management and trade union periodicals. Information conferences and study sessions have been organised, some with the assistance of E.P.A., and others directly by employers' and workers' organisations. For instance trade unions in the United Kingdom, Ireland, Switzerland, France and other countries have held a number of " seminars " to acquaint their members with the basic principles of the ergonomic approach. In some cases such information meetings have been jointly sponsored, thus bringing together employer and worker representatives with different specialists concerned with ergonomic problems. Universities and technological institutes and research bodies are establishing study courses in the field. For instance a course on ergonomics was started last year at the Labour Institute of the Free University of Brussels for engineers, works doctors, industrial psychologists and factory inspectors ; the object is to give them the information which will enable them to humanise the working arrangements in the factories for which they are responsible and to play their part in the international movement which is growing up ; the two-year course covers organisation of work, work layout, industrial statistics and work physiology ; a special diploma is granted on successful completion of the course. A chair of ergonomy

has been set up at the University of Liège. In England courses have been given by research specialists in the various fields concerned at the Universities of Birmingham and Bristol, and the British Productivity Council is organising a series of seminars in various cities and is also making a film on the subject. In addition to organising a three-day national conference in London in September 1960, the Department of Industrial and Scientific Research has made ergonomics an integral part of its programme at three research stations, and 15 other research associations are reported to be undertaking human science research. Similar work is being carried out at university centres in other countries. Finally, the European Productivity Agency is preparing a study session for persons responsible for curricula in engineering schools in European countries, which is to be held in Liège in 1961.

Among the many research centres where work is being done on various aspects of ergonomics, mention may be made of the Max Planck Institute for Labour Physiology in Dortmund. The promotion of further research, the co-ordination of results already achieved, and the publication of the information, are being actively pursued by the British Ergonomic Research Society, in the United Kingdom, and by the Society of Engineering Psychologists and the Human Factors Society, in the United States, both through conferences and the medium of their journals. New impetus will no doubt be given to exchanges between specialists in the various fields concerned as well as the national research centres, following the creation, in 1959, of an International Ergonomic Research Association with headquarters in Zürich, which is to hold its first international conference at Stockholm in 1961.

In industry itself study meetings have been organised for the practical consideration of the problems raised and the solutions offered by the ergonomic approach ; for instance part of the " Journées de l'Industrie " organised under the sponsorship of Ebauches S.A., a firm in Neuchâtel (Switzerland), was given over to these questions. This same firm has issued, for the use of its supervisory staff, a booklet on ergonomic standards, principles and practice. In Germany a special news service has been set up to provide information to engineers on subjects concerned with the adaptation of work to man. A more concrete form of action is that taken by a Belgian steel company—the Société Métallurgique d'Espérance-Longdoz—which has set up a special committee on ergonomics under the chairmanship of the chief medical officer ; during its first year of operation the committee had to deal with many specific problems ; it carried out an educational programme within the firm to bring to all concerned a knowledge and understanding of ergonomics as a guide to their work ; it also laid down broad guide-lines for the use

of suppliers of equipment to the firm in order to ensure that this equipment is in future designed in accordance with ergonomic principles. In France the psychological study section of the Renault automobile works is investigating the ergonomics of vehicles, and its safety and conditions of work section includes a team of engineers, psychologists and physiologists.

Mention should also be made to the activities in the field of ergonomics of industrial research bodies in the United Kingdom such as the British Iron and Steel Research Association, whose department of ergonomics has carried out a number of extremely useful investigations, among others in the design of travelling crane cabs, and the Boot and Shoe Industry Research Association, which has a full-time ergonomist on its staff. A number of large organisations in the Midlands are now using the services of a consultant in ergonomics.

The Work of the Zürich Conference

The value of the Zürich Conference was in bringing together representatives of these various interests to discuss a common problem. In the course of the discussions at the conference a number of useful points emerged. These are summarised below.

Use of Human Biological Scientists by Industry.

There are three ways in which human biological scientists can be useful to industry—in research, in the application of research and in training.

The scientist is always on the lookout for research material and industry offers a valuable field. He admits that he does not know all the answers to industrial problems but he needs the entrée into industry to carry out on the shop floor the research which interests him and which may lead to advantages to industry.

Knowledge is increasing faster than its application and the scientist is concerned that industry should be more aware of what has already been discovered. Difficulties in communication between science and industry are notorious, but both groups must do more to get into touch with each other. This might be done by direct contacts between academic centres and industry, by research associations and national councils, by regional and international organisations and by the publication of articles for the benefit of managers and trade unionists, setting out the principles of ergonomics and describing practical applications to concrete cases. Reference has already been made to some of the efforts already made in this direction in several European countries.

One further way of improving communications between science and industry would be by using the scientists to present the basic

concepts to the undergraduate chemist, engineer or future manager so that he would be aware of the possibilities of using these techniques when he later went into industry. Post-graduate training courses and conferences at universities and technical colleges might also be used to improve appreciation on the part of management of what the ergonomist can do. That this is already being done in a number of centres is evidenced by some of the activities described above, especially the E.P.A. study session to be held at Liège in 1961.

The Economic and the Humanitarian Approach.

It should be clear that there are two sides to the ergonomic approach. One is essentially humanitarian and is concerned with bettering the working environment and adapting it with the comfort of the worker in mind. The other involves considerations of technical efficiency through which, by the appropriate design of tools and methods, productivity and production are increased.

The biological scientist, however, looks upon his essential role as that of producing objective facts about people in an impartial manner. The application of these facts to a given work situation may have economic implications in some instances, technical ones in others and humanitarian ones in yet others, or it may involve all three. Such a scientist, while being fully aware of the economic aspects of any problem which he is called upon to tackle, should not deal with these aspects specifically, as he is neither directly concerned with them nor is he professionally qualified to do so. The ideal answer to a given problem might well be very costly indeed, but the specialist may be in the position of being able to suggest alternative methods which would be less costly and yet be equally or almost equally suitable from the point of view of ergonomics.

There is obviously a danger—often expressed as a fear by trade unionists—that biological data may be applied too literally. In this connection it cannot be emphasised too strongly that such data must be interpreted by qualified people with the greatest care before the conclusions they embody can be intelligently applied to specific industrial conditions. Any figure (for heat stress or the capacity for muscular work for example) represents only the middle of the range—variability being an essentially human characteristic—and cannot be applied arbitrarily to the design of a machine or the layout of a workplace. In any situation several factors are likely to be operating simultaneously, and while a great deal may be known about some of these from the laboratory angle, the chances are that others would be less well known. Engineers, therefore, should not use biological data without the active co-operation of the biologist.

Although this view may sometimes quite naturally encounter resistance on the part of engineers themselves, it is a caution that must be heeded if the benefits to be derived from ergonomics are to be fully developed and not impaired by misuse.

In this connection it is worth noting that the worker himself, if he is intelligently consulted in regard to the machine he is operating, or if his ideas are sought in connection with the redesign of his equipment or workplace, has often proved to be a useful—if unofficial—member of the ergonomic team. Practising ergonomists have repeatedly emphasised the valuable contribution made by the operator, from whom they have often received excellent practical ideas.

From the point of view of management, the changes in the work environment, or in working methods, which analysis by an ergonomist may call for necessarily imply expense, and a limiting factor in any industrial operation is cost. But if it can be demonstrated that part at least of the cost of an improvement is returned in the form of increased productivity of the individual worker, then industry is more likely to embrace ideas which are essentially humanitarian in their concept. Furthermore, benefits which characteristically reflect an improvement in morale have been repeatedly shown to follow from the application of ergonomic principles to the design of machines, equipment and working environment. Although it is often difficult to assess their value in exact monetary terms, a reduction in turnover and absenteeism or an improvement in labour-management relations is welcomed as a positive advantage by any reasonably progressive firm.[1]

At the Zürich Conference, Dr. F. Faubel, President of the German Chemical Industries Employers' Federation and Vice-President of the Conference, speaking on behalf of the employer participants, expressed their active interest in the ideas developed at the session and stated that they were generally agreed on the usefulness of the ergonomic conceptions which had been demonstrated ; these were of value not only in improving productivity —particularly in small and medium-sized firms—but in reducing the strain connected with certain industrial tasks, and thus con-

[1] A recent article by an ergonomist puts this point in the following terms : " But more recently it has been realised that to study working conditions from the operator's point of view—in cold, commercial terms—is not just altruistic, it's good business ! For obviously, if a worker is enabled to perform his job more quickly, more easily, more accurately, with greater comfort and with fewer frustrations, the more pride he will take in his work, the higher the standard he will attain, the later the onset of boredom and fatigue, the lower the rate of absence through psychological sickness, and the lower the rate of turn-over of staff." See A. CROSS : " Some Observations on Ergonomics ", in *Time and Motion Study* (London), Vol. 9, No. 11, Nov. 1960, pp. 21-27.

tributed to the health and well-being of the work community. The European industrial federations concerned would be encouraged to promote knowledge and use of these principles by their member firms.

For his part, the individual worker will rapidly recognise the value of a technique which tends to improve his working environment or to facilitate his task. Through their unions the workers have also endorsed the ergonomic approach, with one clear proviso, however. The findings of the applied biological sciences must not merely be used to increase productivity but must be definitely recognised as a means for helping man at work. The spirit of this acceptance by trade unionists was well expressed at the Zürich Conference by Mr. L. T. Wright, General Secretary of the Amalgamated Weavers' Association (United Kingdom) and Representative of the O.E.E.C.'s Joint Trade Union Committee and Vice-President of the Conference, who stated, on behalf of the worker members present, that if these new findings were to be really useful in industry it was essential that workers should not be mistaken for hands on machines, but that their human dignity should be fully recognised. It was also important that scientists should be aware of the attitude of the trade unions to industrial problems, and, in order to prevent misuse of ergonomic findings, the trade unions themselves must actively participate in all steps intended to further its application.

As has already been mentioned, this last suggestion has indeed been given effect in a number of European countries, where conferences have been sponsored by trade unions, by employers' organisations and in some cases jointly, to acquaint their members with these new concepts and to discuss their implications for those concerned.

Summary

Despite all the advances which have been made in the last decade in adapting machinery and the working environment to man's capabilities and limitations, much still remains to be done. The intelligent use of human resources has not kept pace with technological progress. It is now becoming clear that machines can serve to remove much of the burden and drudgery from our working lives ; neither physically nor mentally arduous labour has anything to commend it as such, yet many jobs are still carried out under conditions which impose undue physiological or psychological stress on the worker.

Since the Industrial Revolution, the accent has, until fairly recently, been placed more on engineering or materials technology than on aspects of human technology—the " human use of human

beings ". We now have the means to measure human capacity better than ever before. Refinements of instrumentation enable us to evaluate human performance under stress in a manner similar to the way in which we determine the characteristics of materials under extreme conditions (or under repeated stress, which becomes critical at much lower intensities) ; and, just as the testing of materials to their limits can give valuable clues regarding their performance under normal conditions of operation, so new methods of measuring human performance under different types of stress can give accurate indications of the level at which damage might begin under apparently " normal " conditions. The object of applying ergonomics to industry is primarily to ensure that men are not called on to carry out tasks dangerous to their health or which may prove harmful to them over time.

In its early days the International Labour Organisation was faced with the urgent need to deal on a world-wide scale with often shocking working conditions which, even in the most advanced countries, gave rise to a high incidence of accidents and disease among workers in all kinds of industrial activity. The techniques of medicine and engineering were harnessed to deal with these vital problems. Now, with the gradual improvement of working conditions throughout the world, although much still remains to be done in the basic fields of safety and health, the emphasis is shifting from these fundamental preoccupations to the means of achieving steadily rising productivity with a corresponding improvement in working conditions, which in time should lead to higher morale among workers.[1]

Nor need this attitude be confined to the highly industrialised countries. At the 43rd Session of the International Labour Conference in 1959 the attention of delegates was drawn by one speaker to the applications of ergonomics in Asian countries, thus highlighting the relevance of this new technique for countries in the process of economic development. A special project in India relates to the development of three regional labour institutes, in which, among other questions to be dealt with, the special problems of work and workers will be studied by physiologists and psychologists.

Other international and regional organisations have already shown considerable initiative in this field ; in particular, as was indicated earlier in this paper, the European Productivity Agency has been a pioneer in stimulating the interest of management and

[1] In this connection it is worth noting that the definition of occupational health adopted by the First Session of the Joint I.L.O.-W.H.O. Committee on Occupational Health in 1950 expressed the idea that the field of occupational health was concerned with the adaptation of work to man and of each man to his job.

workers (through the Conference on Fitting the Job to the Worker) in the advantages to be derived from the application of ergonomic principles to industry. This Conference has in turn encouraged increased activity by individual scientists and research organisations already interested in this field ; it has led to meetings in a large number of countries and encouraged efforts to apply these techniques more widely in industry.

These initiatives must be followed up throughout the world. The rewards are likely to be considerable in terms of productivity and economics, but more important is the release of man's physical and mental capacities from the crippling bane of heavy, hazardous, dull and repetitive tasks to allow fuller scope for his unique human qualities of creativeness, enthusiasm, initiative, loyalty, aspiration and fulfilment.

Appendix

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Employees' Rights in Their Inventions

A Comparison of National Laws

by

Fredrik NEUMEYER[1]

The question of the rights of employers and employees in connection with inventions made by the latter in the course of their employment was first taken up by the International Labour Organisation long before the Second World War, and its advisory committees on professional workers and salaried employees adopted resolutions on the subject in 1929 and 1931 respectively.[2] *Today, when independent inventors are tending to become steadily rarer and a growing majority of inventors are salaried employees in public or private service, the question is of even greater importance. It was for this reason that the committee set up by the International Labour Conference at its 43rd Session in 1959 to study the problems of non-manual workers called upon the I.L.O. to make the necessary studies with a view to convening a committee of experts to consider the problems of salaried inventors.*

In the following pages a recognised international expert examines the different forms of legal regulation of the rights of employee inventors in force in a wide range of countries.

THE special relationship between employee inventors—meaning not only persons specifically employed as inventors but any employee, whether in the private or the public sector, who happens to make an invention—and their employers is extremely complex. A first group of problems concerns the position occupied by an employee inventor in the enterprise of his employer, the circumstances under which an invention made in employment was conceived and carried out and the means the inventor used in producing it, the individual or collective contract under which he was employed, the professional training he had before starting employment and the further development of his knowledge and experience

[1] A detailed comparative study of the subject is being prepared by the author for the Subcommittee on Patents, Trade-marks and Copyrights of the United States Senate Committee on the Judiciary.

[2] See I.L.O. : *The International Labour Code, 1951*, Vol. II : *Appendices* (Geneva, 1952), pp. 243 ff.

in the course of employment. Next comes the basic question whether special compensation of the inventor is justified, and, if so, what constitutes " reasonable " compensation. The essential element here is of course whether the employer has an automatic (original) or an acquired right to use the different types of inventions made in the course of employment and to what extent this right is free from payment and transferable ; or whether " company inventions " exist, implying that no individual physical person can be traced as the author of an invention other than the employing enterprise as such. Finally it must be decided what authority shall settle disputes concerning the rights and obligations of employee inventors, and whether a right of appeal against such decisions shall exist.

How these problems are regulated in various countries will be the subject of the present study.

The law of salaried inventors is a comparatively new branch of law.[1] Its development is closely connected with increasing industrialisation and its two main components are taken from labour law and patent law respectively. Since patent laws are, as a rule, much older than labour laws, the former can rely on a number of basic concepts that are well established by law and judicial practice, whereas the legal relations between employer and employee are still subject to rapid change in many countries. Moreover the social character of many problems of labour law makes this aspect of the development of the law of employee inventors more dependent upon the political situation in the respective countries.

In spite of national differences, however, a review of the legal situation in most countries shows that the alternative ways of regulating the rights and obligations of employee inventors fall into five main categories.

The first and historically the earliest system was the insertion of provisions concerning employee inventors into patent law. This solution was adopted by Austria, Finland, the Netherlands, Italy, Canada and Japan (in chronological order). These laws embodied the traditional notion of exclusive rights for the inventor commonly used in western countries. A similar form of regulation was adopted by the Soviet Union and other Eastern European countries through

[1] Efforts have long been made by international organisations, especially the International Labour Office in Geneva and the Berne Bureau for the Protection of Industrial Property, to develop this field of law by discussing and drafting international rules acceptable to all member countries. For a historical review of these efforts see F. NEUMEYER : " Efforts entrepris pour parvenir, dans le cadre des organisations internationales, à un accord international sur les inventions faites en cours d'emploi ", in *La propriété industrielle* (Berne, Bureau international pour la protection de la propriété industrielle), 76th Year, No. 6, June 1960, pp. 107 ff.

the enactment of laws regulating inventive activities protected by patents and based on the socialist economic system. Patent laws following the general principles of the Soviet concept of labour and of the place of inventive activity in planned industrial production (revised legislation of 1959) were issued in Yugoslavia in 1948, in Bulgaria, Rumania and the German Democratic Republic in 1951, in Poland in 1951-52, in Hungary in 1953 and in Czechoslovakia in 1957.

The second system was that adopted by Switzerland, where provisions concerning employee inventors were inserted into the law concerning contracts and the employer-employee relationship, the so-called Law of Obligations.

The third method consists in passing a special law devoted exclusively to the rights and obligations of employee inventors and their employers, and the legal problems arising from these relations. The first modern law of this type was issued by Sweden in 1949, followed by Denmark in 1955 and the Federal Republic of Germany in 1957.[1] In the course of the unification of law which is being carried out in the Nordic Countries special enactments regarding employee inventors, based on the Swedish and Danish models, are being prepared in Finland and Norway.

The fourth type of legal solution relies mainly on precedents established by the courts and by official boards specially instituted to give guidance in the matter. This method, which is exemplified by the United Kingdom and the United States, must naturally be based on individual cases of legal conflict, either between two private parties or between a private party and the Government. Hence it cannot cover the whole field consistently and comprehensively, since the rules originating from these decisions depend necessarily on a number of accidental circumstances. From a detailed study of common law and " judge-made law " it is, however, possible to distinguish certain basic principles applicable to employee inventors, akin to the principles operating in other countries.

Finally there are countries where the relations between employee inventors and their employers are regulated by collective agreement, in some cases alongside one or other of the four methods outlined above, but more typically in countries where there is at present no specific legislation on the subject (e.g. in France, Norway and the United States). Similar provisions may be found in the standard rules issued by certain professional organisations, especially those of consultant engineers, architects and chemists.

In what follows, the legal situation of employee inventors in a number of countries will be examined under the first four of the

[1] The German Act revised earlier ordinances promulgated in 1942-43.

above headings. Since collective agreements are, as a rule, concluded only for a limited period and may well vary from one industry to another, they elude analysis and no study will be made of their provisions here.

Regulation by Patent Law (Classical Type)

Austria

The Austrian Patents Act of 11 June 1897 contained the following provision :

> Workmen, salaried employees and civil servants are considered to be the authors of inventions made by them in service unless otherwise stipulated by agreement or by service rules. Any provision in contracts or service rules by which a person employed by an enterprise, or a civil servant, is deprived of the reasonable benefit of an invention made by him in service is without legal effect.

In 1925 the Patents Act was replaced by a new law, in which the provisions regarding employee inventors were included in a special article (sections 5 *(a)* to *(o)*). The general sense of the provisions introduced by the Act of 1925 is as follows :

Employees are entitled to have patents granted on inventions made by them in the course of their employment unless otherwise stipulated by contract, except that in the case of the public service the employer may claim full rights in or a right to use service inventions without any agreement (section 5 *(b)*). " Employee ", for the purposes of the Act, means any salaried or wage-earning employee of any kind (section 5 *(a)*). Agreements between employers and employees providing that the employer shall own or have a right to use future inventions are valid only if they concern service inventions. A " service invention " is defined as any invention the subject-matter of which falls within the field of work of the enterprise and where *(a)* the activity which has led to the invention forms part of the service duties of the employee, or *(b)* the employee received the stimulus to make the invention through his activity in the enterprise, or *(c)* the making of the invention was substantially facilitated by the use of the experience or resources of the enterprise (section 5 *(b)*).[1]

[1] This definition was strongly attacked by Austrian employer experts. See E. Adler : " Die österreichische Patentgesetznovelle von 1925 ", in *Zeitschrift für das gesamte Handelsrecht und Konkursrecht* (Stuttgart), Vol. 89, 1926, p. 118. Criticism centred, in particular, on the ambiguity of the expressions " subject-matter " and " field of work ", as well as on the fact that the Austrian concept of service inventions deviated so greatly from projected German legislation of the same period and from provisions in German collective agreements.

Under section 5 *(c)* " the employee is entitled in each case to reasonable special compensation for assignment to the employer of an invention made by him, as well as for ceding the right of use in relation to such invention ". However, if the employee is employed in the enterprise expressly for inventive work and this work has led to the invention, he is entitled to special compensation only to such extent as any higher remuneration payable under his contract of service in respect of his functions as an inventor do not already constitute reasonable compensation for the invention.

A special section (5 *(j)*) covers cases where the employer later wishes to surrender all or part of the rights in a service invention covered by a prior agreement with the employee. In such a case the latter can demand that the rights of the employer be assigned to him to the extent that the employer surrenders them.

Jurisdiction for disputes connected with private employment contracts lies with the provincial labour courts (in appropriate cases) or with the ordinary courts (section 5 *(m)*).

When Austria was occupied by Germany in 1938 all Austrian laws were abolished. A systematic harmonisation of the legislation of the two countries was carried out rapidly from the German side. Since, however, in the legal field in question Austria was much more advanced than Germany, it is fairly safe to assume that the provisions of the Austrian Patents Act of 1925—although formally abolished—had a marked influence on the development of German law, and in particular on the German ordinances regarding employee inventors of 1942 and 1943 (see below).

In 1945, when the Republic of Austria was restored, the old Austrian laws were reintroduced step by step. In July 1950 the Patents Act was re-enacted and the provisions regarding inventions made by employee inventors, which were taken over entirely unchanged from the Act of 1925, were embodied in article 5 *(a)* to *(n)* and article 6.[1]

Canada

In Canada the rights and obligations of employee inventors are covered by certain provisions of the Patents Act of 1935 [2], but the categories of employees dealt with in this law are very limited. They include, on the one hand, " any officer, servant or employee of the Crown or of a corporation which is an agent or servant of the Crown " (sections 19A, 19B) and, on the other hand, any " person while employed in the public service of Canada " (section 46). Inventors employed in private industry are obviously outside the scope of the Act.

[1] *Bundesgesetzblatt für die Republik Österreich*, 1950, 34. Stück, nr. 128, pp. 599 ff.

[2] Chap. 32, 25-26 Geo. V, 1935, as amended by Chap. 23, 11 Geo. VI, 1947.

The first groups of inventors must assign all the benefits of any invention " in instruments or munitions of war " to the Minister of National Defence if he so requires and if the invention was made within the scope of their duties and employment as such (section 19A (1)). Such assignment does not entitle the inventor to compensation. Any other inventor who assigns an invention to the Minister is entitled to compensation (section 19A (2)). Inventions made by public servants within the meaning of section 46 of the Patents Act, and related to the nature of the employment of the public servant, are subject to a number of conditions ; for example the Commissioner of Patents may grant to any applicant a licence to use the patented invention on terms fixed by him (section 46 (1)*(a)*). The patentee may not make use of or allow others to make use of the invention without the consent of the Commissioner. The Attorney-General may restrain unauthorised use of such inventions and recover damages in case of unauthorised use (section 46 (1) *(c)* and *(d)*). Disputes regarding whether an invention comes within the terms of section 46 are decided by the Commissioner (section 46 (2)), whose decision is subject to appeal to the Exchequer Court (section 46 (5)). Outside Canada the inventor has full enjoyment of his invention (section 46 (4)).

The Research Council Act of 1924, which created the National Research Council and gave it responsibility for all matters affecting official scientific and industrial research in Canada, prescribes rules governing the assignment of rights in inventions made by the staff of the Council, vesting such inventions in the Council (including foreign rights). The Council is authorised to make the patented inventions available to the public, for instance on a royalty basis, and to pay bonuses or royalties to inventors.

Japan

In Japan the rules regarding employee inventors are part of patent law. Article 35 of the new Patents Act of 13 April 1959, which came into force on 1 April 1960, covers the field of service inventions. This article lays down that any employer, including the State and local public bodies, shall have a non-exclusive licence in relation to any patent obtained on an invention coming within the scope of the business functions of the employer and by its nature and origin embraced within the duty of the employee. Except in the case of such service inventions, acquisition of the patent right or of an exclusive licence for such inventions on the basis of contract or terms of service concluded in advance is null and void. Acquisition by the employer of the patent or an exclusive licence entitles the employee to payment of reasonable compensation, calculated

according to the profit obtained by the employer from the invention and the extent to which the employer contributed to bringing it about.

Netherlands

On 7 November 1910 a Patents Act based on a Bill presented to the Netherlands Parliament in 1905 and containing a section covering the questions of ownership of inventions made by employees and of compensation for such inventions was issued in the Netherlands. This Act was amended in 1931 and 1936, and by a royal proclamation of 13 April 1954 a new section 12A was added, which came into force in May 1957.

As the Act now stands the relevant provisions are as follows:

Section 10.

1. Where the product, process or improvement for which a patent is filed has been invented by a person in the employment of another person and the nature of this employment requires him to use his special knowledge in order to make inventions of the same kind as that to which the application relates, the employer has full title to the patent to be granted.

2. Where, in such a case, the inventor cannot be deemed to be compensated by the salary he has earned, or any special payment in addition to his remuneration received in compensation for assignment of the patent, the employer is obliged to pay him an equitable sum, having regard to the financial importance of the invention and the circumstances in which it was made. Should the employer and inventor be unable to agree on the sum, they may apply in writing to the Patent Office, requesting that the sum be determined by that office. The Patent Office shall comply with their request, and its decision shall be binding on the parties....

3. ... Any stipulation departing from the provisions of the foregoing subsection shall be null and void.

Section 12A.

1. A person who has made an invention for which an application for patent is filed, but who, by virtue of subsection 1 of section 10, or of an agreement contracted with the applicant or with his predecessors in title, is not entitled to the ownership of a patent, shall have the right to be mentioned as the inventor in the patent.

2. Any stipulation departing from the foregoing subsection shall be null and void.

In the Netherlands there are a number of institutions administered by the State, in which employees engaged in development and research work produce inventions of different kinds.[1] These institutions have introduced special regulations concerning inventions made by their employees.

[1] Well known among these are the state post and telephone administration and the state mines in Limburg, the latter comprising collieries and large chemical plants.

Italy

A basic reform of the laws concerning industrial property rights was initiated in Italy during the 1920s and had by September 1934 led to an entirely new draft law concerning patents, trade marks and designs. The Bill contained three paragraphs which for the first time indicated principles governing the rights in inventions " made in the performance of a labour or service contract or relationship ", as well as related questions of compensation and arbitration. However, the Bill was never enacted and in 1939 it was decided to reform the entire system of law regarding rules of competition and to divide it into a series of special laws which could be enacted one by one. The patent law was enacted on 29 June 1939 and came into force on 1 May 1940.[1] This law contains (in articles 23-26) the provisions originally drafted for the Bill of 1934. The most important of these are as follows :

23. Rights arising out of inventions made in the performance of a labour or service contract or relationship in which inventive activity is specified as an object of the contract or relationship and remunerated as such, belong to the employer : provided that the inventor shall have the right to be acknowledged as the author of the invention.

If no compensation is provided for and fixed as a reward for inventive activity and the invention has been made in the performance of a labour or service contract or relationship the rights arising out of the invention belong to the employer : provided that the inventor has, in addition to the right to be acknowledged as the author of the invention, a right to reasonable compensation, in the fixing of which the importance of the invention shall be taken into consideration.

24. Even if the conditions laid down in article 23 are not fulfilled, the employer has, in the case of inventions within the field of activities of the private enterprise or public administration in which the inventor is employed, a pre-emptive right as regards exclusive or non-exclusive use of the invention, acquisition of the patent or the filing or acquisition of patents abroad. . . .

Provision is made in article 25 for arbitration in any case covered by the above two articles in which no agreement is reached regarding compensation or other conditions, or for the (non-reviewable) decision to be taken by the Minister if the inventor is a public servant of a government agency.

It must be added that, in cases in which the employer has proprietary rights in the inventions of his employees, these, according to the Italian concept, are original and are not in any way assigned to him. Further, it is clear that the concept of " company inventions " does not exist in Italy.[2]

[1] *Gazzetta Ufficiale*, No. 189, 14 Aug. 1939, pp. 386 ff.

[2] The question of employee inventors is dealt with in certain Italian commentaries on labour law. See for instance FRANCESCHELLI : *Lavoro autonomo, lavoro subordinato e invenzioni di servizio* (Terni, 1952) ; SANTORO-PASSARELLI: *Nozioni di diritto di lavoro*, 7th ed. (Naples, 1954); SANSEVERINO: *Diritto del lavoro*, 7th ed. (Padua, 1955).

Regulation by Patent Law (Socialist Type)

Soviet Union

Since, in the Soviet Union, almost all inventors are employed either to improve production techniques in enterprises owned and controlled by the State or to pursue scientific research in state institutions, all laws and regulations concerning the protection of industrial property in the Soviet Union can be said to concern employee inventors. The same is true of the rules of compensation for inventions, which play an outstanding role in the Soviet system of law regarding inventors and reflect the notion that the State is responsible for the well-being of all productive citizens.

In 1957 the Inventions and Discoveries Committee of the Federal Council of Ministers and the Central Council of Trade Unions drafted a new ordinance regarding compensation, replacing the regulations issued in 1942. The new ordinance, together with rules for its application, was enacted in April 1959, with effect from 1 May 1959.[1]

Russian legislation distinguishes three categories in this field —inventions, discoveries, and suggestions for rationalisation—each of which is carefully defined. It provides for the issue of a certificate of authorship or a patent in the case of inventions, of a diploma in the case of discoveries, and of a certificate of authorship in the case of suggestions for rationalisation.[2]

The rules for compensation issued on 24 April 1959 distinguish between (1) lump-sum payments to recipients of certificates of authorship or of diplomas for discoveries and (2) compensation for inventions and suggestions for rationalisation based on the results of their application. A third type of compensation is that paid in the form of rewards to persons who have co-operated in the application of inventions and suggestions or have shown initiative in utilising them in other enterprises. These rules are embodied in a document detailing a great many different types and cases of financial rewards.[3] A few typical examples may be indicated here.

When issuing a certificate of authorship for an invention the Inventions and Discoveries Committee pays a lump sum of 200 to

[1] *Pravda*, 20 May 1959.

[2] One of the basic differences between Western and Soviet legislation is that scientific discoveries in the Soviet system fall under rules of automatic compensation—an expression of the fact that the State considers itself responsible for all scientific achievements. The other categories, i.e. inventions and suggestions for rationalisation or technical improvements (of a non-patentable character) have parallels in Western countries, e.g. the Federal German Act of 1957 on employee inventors.

[3] A French translation of these rules appears in *La propriété industrielle*, 76th Year, No. 1, Jan. 1960.

2,000 roubles, the amount of which is deducted from the compensation based on the results of the practical application of the invention if this exceeds the original lump sum. When it issues a diploma for a discovery the committee pays a lump sum of up to 50,000 roubles. The compensation paid to the author of an invention or of a suggestion for rationalisation depends within certain limits on the savings resulting from the invention during the first year of its application.

The amounts of compensation are listed in a schedule. This provides for minimum and maximum amounts of 200 roubles and 200,000 roubles for inventions and 100 roubles and 60,000 roubles for suggestions for rationalisation, in both cases according to a sliding scale.

The rates of compensation may in certain circumstances be increased by 10 to 300 per cent. depending, among other things, on whether the invention makes it possible to start new branches of production or to produce new valuable materials, machines or products, or whether a suggestion is accompanied by an engineering draft, workshop drawings or a working model, unless this engineering groundwork has been done as part of the employee's service or under a contract.

Under the rules, compensation for rationalisation suggestions is calculated on the basis of the savings resulting in the second year of use (and not the first year of use, as in the first draft of the rules). Compensation is paid whether the suggestion arises out of the normal activity of the inventor or not. Disputes concerning the origin of inventions and suggestions, the amount of compensation and so forth are referred to the ordinary courts.

German Democratic Republic

The German Democratic Republic has built up an extremely elaborate system of rules and regulations covering all inventors working for socialist enterprises or in any other way contributing to the technical progress of the country.

A Patent Act of 83 sections was issued on 6 September 1950 which, among other things, distinguishes two main types of patents: " exclusive patents " of the type commonly known in Western European countries and belonging to the inventor, and " economic patents ", which may be used by the patentee and by others officially authorised by the patent office. For the use of the latter type of patent, compensation is fixed by law and must be paid to the patentee according to special rules (section 64), and boards of arbitration are set up for the settlement of disputes regarding compensation for these patents (sections 44-50).

A more detailed ordinance regarding inventions and suggestions for improvements in the socialist sector of the economy was promulgated on 6 February 1953.[1] This provided for special inventions and suggestions bureaux in all socialist enterprises and in government departments, and restated the right of the inventor to financial compensation assessed as a share of the benefits to the national economy resulting from the invention. Boards of arbitration are created to settle disputes regarding compensation for suggestions. Three implementing ordinances were also issued on the same day. The first regulates the organisation and functions of the new inventions and suggestions bureaux; the second defines the scope of the term " suggestions " and establishes a system of compensation for them ; and the third lays down the composition of boards of arbitration and their procedure.[2]

Three further sets of regulations were issued on 13 August 1954, 6 May 1959 and 14 October 1959.[3] These introduce new concepts entirely unfamiliar in any other country, such as special accounts designed to encourage employees to make efforts beyond their normal professional duties.

Since 1959 the laws of the German Democratic Republic in this field have been under revision, and in February 1960 three drafts were published for a new patent law, a new ordinance laying down rules for the payment of compensation for inventions, and an ordinance concerning the " innovations campaign ".[4]

The draft for a new patent law maintains the distinction between exclusive and economic patents, the latter to be granted for new inventions that can be put to practical use in the national economy. The main principles concerning employee inventors are incorporated in sections 5-11, which deal, among other things, with service inventions and proprietary rights in them, the obligation of the employee to communicate inventions and to file patent applications for inventions important for the national economy and for the employer, and the right of the inventor to be cited in the patent and to receive compensation.

The new draft rules on compensation follow the general lines of the Soviet legislation and include a table for the assessment of compensation in accordance with usefulness.

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[1] See *Gesetzblatt der Deutschen Demokratischen Republik* (Berlin), No. 21, 17 Feb. 1953. French translation in *La propriété industrielle*, 70th Year, No. 9, Sep. 1954, pp. 189 ff.

[2] Ibid.

[3] *Gesetzblatt der Deutschen Demokratischen Republik*, No. 75, 28 Aug. 1954 ; No. 32, 26 May 1959 ; and No. 59, 27 Oct. 1959.

[4] Reprinted in *Erfindungs- und Vorschlagswesen* (Berlin), 1960, No. 2, edition C, pp. 21 ff., 32 ff and 35 ff.

The draft ordinance on the "innovations campaign" covers all suggestions involving economic or other advantages for society "especially in the technical, economic, managerial and administrative fields", and obviously comprises a much wider group than patentable inventions. The rules are applicable to all socialist and similar enterprises, socialist co-operatives and administrative organisations. The patent office has general advisory and supervisory functions in connection with these activities.

Acknowledgment of suggestions can be made in five different ways—by honours conferred by the Government, other honours, medals, public praise or testimonials, and compensation or bonuses. Compensation is payable only for special work over and above what is required of the employee under his employment contract; it is paid in the form of a lump sum based on known or estimated benefits accruing from application of the suggestion for one year. Tax reduction is granted in respect of these payments.

Czechoslovakia

A new Patents Act of 49 sections was issued in Czechoslovakia on 5 July 1957 and came into force on 15 August 1957.[1] This establishes the same classification of employees' inventions as is used in the Soviet law and that of other Eastern European countries.

Provisions regarding the rights and obligations of employee inventors and of the enterprises employing them are to be found in various part of the law. Section 2 (3) states that, if an invention has been made in the course of work in the enterprise or the author of the invention has received substantial help from the enterprise, he must disclose these facts when applying for a patent and must at the same time inform the enterprise of his application. The term "enterprise" covers both state-owned industries and other business organisations, as well as state administrative organisations. The State has the right to exploit such inventions ; if it decides to do so it must conclude a contract with the inventor covering the part to be played by the latter in the practical application of the invention, the compensation to be paid to him and the manner in which it is to be paid (section 3 (6) and (7)). If such inventions are patented or exploited abroad, the inventor has a right to special compensation by contract (section 3 (9)).[2] Persons who have contributed to the practical application or dissemination of inventions

[1] A French translation of the law appears in *La propriété industrielle*, 74th Year, No. 5, May 1958, pp. 86 ff.

[2] Patent protection abroad is, however, only permitted after a patent for the invention has been filed in Czechoslovakia, and provided it is found to be new there (section 25 (1)).

and suggestions for improvement are entitled to compensation fixed by the patent office, the Ministry of Finance and other competent organisations (section 39). Such compensation is free of tax (section 42 (1)). Other benefits may be granted to persons making inventions, such as research or travel fellowships, housing facilities, special leave, or similar advantages (section 42 (3)). Disputes regarding compensation are to be handled by the ordinary courts (section 33), except where provision exists for arbitration by competent trade union organisations (section 3 (8)).

A number of provisions lay an obligation on enterprises to foster and develop the profitable use of the creative talents of inventors, to provide them with advice and assistance free of charge, and to co-ordinate their activities in accordance with the state plan for the economic sector concerned, for instance by propaganda, competitions, prizes and so forth (sections 36-38 and sections 45-46).

Poland

A special ordinance on employee inventors was issued in Poland in 1950.[1] This comprises 34 sections and is divided into five parts: (1) general provisions; (2) rights of employees; (3) procedure for communicating, patenting and exploiting employees' inventions; (4) sanctions against employees for concealing their inventions or for assigning them to third persons or impeding use of them; and (5) transitional provisions. The text covers both inventions and technical improvements and innovations, in the same way as Soviet legislation. It applies to all persons employed in an enterprise, whether as public officials, under a private employment contract or on commission (section 1 (2)) and similar employees of occupational or social associations and organisations (section 29).

The right to exploit inventions made by employees—and indeed the obligation to do so—belongs to the enterprise (section 15). The principles for compensation are established by the Council of Ministers. The right to compensation for service inventions (as defined in section 3) exists only if the contractual remuneration of the inventor is obviously disproportionate to the benefits accruing from the invention (section 18 (2)). Persons who have collaborated in making such inventions receive rewards in accordance with principles fixed by the President of the Commission for Economic Planning in agreement with the Minister of Finance (section 19). Disputes concerning the authorship of inventions are settled by the disputes section of the patent office (section 22 (1)) and disputes regarding compensation by the ordinary courts (section 22 (2)).

[1] A French translation of this ordinance was published in *La propriété industrielle*, 67th Year, No. 10, Oct. 1951, pp. 172 ff.

Regulation by Law of Contracts

Switzerland

In Switzerland provisions regarding employed inventors are to be found neither in a special law nor in the patent law. The Swiss legislator has brought the problems of inventions made in the course of employment under the law of contracts, which in turn is part of the Swiss federal commercial law, the " Law of Obligations ".

In 1911 the first Federal Law of Obligations, which had been promulgated in 1881, was basically revised and reissued as Book V of the Swiss Civil Code. In Title X of this Book (" Contracts of Employment ") we find section 343 [1] regulating inventions made by employed persons. This section provides as follows :

> Inventions made by an employee in the course of his work belong to the employer if inventive activity is comprised in the service duties of the employee or, where this is not the case, if the employer has expressly retained a right to them.
>
> In the latter case the employee is entitled to reasonable special compensation if the invention is of considerable economic value.
>
> When assessing this compensation regard must be had to the assistance given by the employer and to the use made of his property.

This single provision within the framework of a very extensive law leaves a number of problems untouched ; some of these may be solved by the general law, which in Switzerland may mean the individual laws of 22 different cantons. Certain cases involving inventions may also be covered by Titles XIII and XIV of the Law of Obligations, concerning agency and quasi-mandate respectively.

The Swiss Patents Act does not mention employee inventors and did not until 1956 contain any provision regarding the right of an inventor to be mentioned as such in the patent. The new Swiss Patents Act of 1954, which came into force on 1 January 1956, introduced compulsory citation of the name of the inventor in the patent (section 5).

The provisions of section 343 of the Law of Obligations are generally applicable to all kinds of employees ; but since, under section 362 of the same law, all federal civil servants are also subject to the administrative law of the Swiss Federation or of the cantons, inventions made by civil servants are covered by the Federal Act of 30 June 1927 concerning conditions of service of federal employees (sections 16 and 44) and the relevant ordinance of 24 October 1930 (sections 14 and 52). The content of these provisions is in general agreement with section 343 of the Law of Obligations, though

[1] This section has remained unchanged until the present day. A new section 343*bis* of 1958 does not refer to inventions.

somewhat more detailed. According to section 44 of the Act of 1927 the Swiss Federal Council issues regulations governing claims for compensation ; the ordinance of 1930 in fact provides in section 14 that the decision to grant compensation or reward for inventions lies with the government department of which the inventor is an employee, in agreement with the Department of Finance. Finally, section 52 of the ordinance states that special rewards can be granted for useful suggestions regarding technical or economic improvements in administration and production.

A special section of the Act of 1927 (section 60) states that the Federal Supreme Court has exclusive jurisdiction for disputes concerning financial claims of the State or claims against the State arising out of terms of service.

Swiss court decisions on the subject are scarce. The relevant literature therefore has some influence on the interpretation of the current legal provisions. One of the most important statements in this literature is that inventions made by an employee in the course of his employment and covered by section 343 of the Law of Obligations belong directly to the employer and are not in any way derived or acquired from the employee.[1] The same opinion was expressed in 1931 by the Swiss Supreme Court.[2]

The concept of " considerable economic value " of an invention is interpreted as meaning something which cannot fail to bring the employer a substantial advantage.

The concept of " company inventions " (i.e. those made by the enterprise as such, without individual inventors) has not been touched upon by the Swiss legislator. The opinions of leading commentators are divided.[3]

Up to the present, Swiss law courts have had few cases concerning inventions made in the course of employment or to order. Of less than a dozen decisions, three were handed down before the revision of the Law of Obligations in 1911. All other Swiss court

[1] WEIDLICH and BLUM : *Schweizerisches Patentrecht*, I (Berne, 1934), p. 109 ; BLUM and PEDRAZZINI : *Das Schweizerische Patentrecht*, I (Berne, 1957), p. 290 ; and OSER and SCHÖNENBERGER : *Das Obligationenrecht*, Vol. I, Part 1 (Zürich, 1927), p. 1299, No. 18.

[2] *Dr. Meyer* v. *Terpena A.G., Entscheidungen des Schweizerischen Bundesgerichts, Amtliche Sammlung*, p. 304 ff.

[3] WEIDLICH and BLUM express the view that in the course of time enterprises amass a store of methods and experience, secrets and preparatory work, which are at the disposal of employee inventors and on which are based inventions that may appear remarkable to an outsider but are in reality no more than the result of professional work and the use of the enterprise's experiences (op. cit., p. 105). BLUM and PEDRAZZINI state that in modern industry an employee is rarely the sole author of an invention (op. cit., p. 299). For a contrary view see OSER and SCHÖNENBERGER (op. cit., p. 1294), who hold that an invention always implies a creative idea, i.e. that one or more persons may be called the inventors.

decisions are substantially based on section 343 of the law of 1911 or the corresponding section 16 of the Federal Act concerning conditions of service of federal employees.

Regulation by Special Law

Sweden

The question of employee inventors was taken up for the first time in Sweden in 1919, when a committee on the revision of Swedish patent legislation sketched certain provisions according to which the right to a patent belongs in principle to the inventor. The draft resulting from this committee work did not lead to a special law or a reform of the patent law in this respect. In 1938, however, the Swedish Department of Justice initiated discussions on this matter with the other Scandinavian countries and inter-Scandinavian discussions were held in 1938, 1939 and 1941.[1]

In March 1945 an official seven-man committee was appointed by the Swedish Department of Justice to investigate the whole question of the rights and obligations of employee inventors. The terms of reference of this committee underlined the importance of reaching a reasonable balance between the legitimate interests of employers and employees.

In June 1949 an Act respecting rights in the inventions of employees was issued.[2]

This Act is applicable to all inventions patentable in Sweden and to all inventors employed in public or private service (section 1).

There are four categories of inventions (section 3). The first two concern those *(a)* where research or inventive activity are the primary task of the employee and the invention has essentially been made as a result of such activity, or *(b)* where the invention is the outcome of a specific task set by the employee's superior. These two classes are known as " service inventions ". A third category of inventions comprises those which fall within the employer's sphere of activity and have been made in the course of the inventor's employment but have come about in circumstances other than those referred to above. Finally there is a fourth category of inventions, which fall within the employer's sphere of activity, but which have not been made in the course of the inventor's employment.

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[1] Norway and Denmark were prevented during wartime occupation from participating actively in these discussions. A preliminary agreement was therefore reached in 1941 between Sweden and Finland only.

[2] See *I.L.O. Legislative Series*, 1949 (Swe. 6).

An essential mandatory principle of the law, expressed in section 6, is that the employee is entitled to reasonable compensation for any invention to which the employer has acquired full or partial title, regardless of what may have been agreed upon before the invention was made. In assessing and fixing this compensation the law directs that special attention should be given to the value of the invention, the extent of the right that the employer has acquired to it and the degree to which the employment may have contributed to it. In the case of an invention in categories *(a)* and *(b)* above, i.e. a service invention, special compensation is payable only to the extent that the value of the right acquired by the employer is out of all proportion with the amount that the employee has received in the form of remuneration and other benefits associated with his employment.

Section 9 stipulates that provisions in contracts relating to inventions by employee inventors which are clearly contrary to public morals or otherwise improper may be modified or disregarded.

The law (section 10) finally creates a special standing board to which both employers and employees may refer for opinions on points of law. These opinions are intended to provide guidance and are legally binding only where the parties have so agreed in advance.[1]

The existence of this special statutory board does not mean that disputes arising under the law cannot be referred to other similar boards. Thus, under a collective bargaining agreement concluded in 1946 by the Federation of Swedish Employers (S.A.F.) and the Federation of Swedish Industrial Employees (S.I.F.), as well as the Federation of Swedish Industrial Foremen (and revised in February 1958), an arbitration board operating under the general Swedish law on arbitration was created for disputes concerning inventions made in the course of employment.

The official board created in 1950 under section 10 of the law has issued a number of rulings and guiding opinions in individual cases submitted by employers and employees (for the most part by the latter).[2] Many of these cases involved the difficult decision as to whether an employee's invention fell within the scope of his employer's activity or which of the four categories distinguished by section 3 of the law was involved. The majority of them also

[1] The board consists of a chairman and six other members. The chairman and two members are appointed by the Government for a number of years and may not represent the interests of either employers or employees. The chairman and the vice-chairman must be qualified as judges, and one member must possess special knowledge and experience in patent matters. Of the four remaining members, two represent employers' interests and two those of employees.

[2] As well as five advisory opinions to the Government, dealing with reasonable compensation for military inventors.

entailed assessment of " reasonable compensation " of inventions on the basis of their present and future value to the employer and the share of the inventor and his employer in their origin. The opinions issued on these cases clearly reflect the necessity of analysing the origin of an inventive idea and its usefulness in practice in order to reach a fair decision.

Among the other questions that have arisen, mention may be made of the following : What are the principal tasks of an employee? When is an invention the outcome of a specific task assigned by order of the employee's superior ? What is the sphere of activity of an employer ? How is " communication of an invention " by the employee to be defined ? To what extent and when must the acquisition of inventions by an employer be exactly defined ? [1]

Denmark

Denmark was the first European country to follow the example of Sweden and to resolve the question of employees' inventions by special legislation. A committee set up by the Danish Ministry of Commerce in February 1950 submitted, in March 1951, a report containing a draft for a special law regarding inventions, discoveries and professional secrecy, and a law respecting employees' inventions was passed by the Danish Parliament on 29 April 1955.[2]

The main features of the Act of 1955, which has only 14 sections, are as follows. The law applies to all employees in public service or private employment. Teachers and other scientific staff at universities and other institutions of higher education are not considered to be employees and own the full rights to the inventions made by them. Service inventions are defined in the following terms :

> Where an employee has made an invention which may be considered to have resulted from his service, the employer may claim that the right to the invention shall be assigned to him for one or more countries, if the exploitation of the invention falls within the sphere of activities of the enterprise. The employer has the same rights if the exploitation of the invention does not fall within the sphere of activities of the enterprise, provided the invention was made by the employee as the outcome of an order specifically given to him by the enterprise.

If the employer acquires the right to an invention made by an employee, the latter is entitled to reasonable compensation, unless

[1] It should be borne in mind that a number of important opinions issued by the official board were never published, since the necessary permission of the two parties could not be obtained. In addition the activity of the industrial arbitration board is limited in practice, since settlement of disputes concerning inventions made by employees in private service is often easier to reach " out of court ", by such means as promotions, salary increases or other benefits of value to an inventor.

[2] Act No. 192 of 29 April 1955.

otherwise agreed or unless the value of the invention does not exceed what can reasonably be expected of the employee under his terms of service. In assessing compensation special regard must be had to the value and importance of the invention to the enterprise, to the conditions of employment of the employee and to the degree to which his employment may have contributed to the invention.

In contrast to Swedish law, Danish law recognises " company inventions ". These inventions are defined as follows (section 4 (1)) :

> Where an invention has come about by co-operation between a number of persons in an enterprise in such a way that it is not possible to identify certain individuals as the inventors, the enterprise is considered to be the inventor.[1]

The Danish law expressly abstained from creating a special arbitration board for settling disputes between employers and employees.[2]

There are only a few court decisions giving an appraisement of the legal relations between employers and employee inventors.

Federal Republic of Germany

The special law promulgated in the Federal Republic of Germany in 1957 to regulate the rights of employee inventors is chronologically the third in Europe after Sweden (1949) and Denmark (1955). The roots of the German law are, however, to be found in the ordinances issued in 1942 and 1943, and the implementing instructions regarding compensation for employees' inventions dated 1944.

The ordinance of 1942 provided that an employee must place an invention made by him at the disposal of his employer " where it has originated from his work in the enterprise ", and that the employer must pay reasonable compensation. These two principles were novelties in German law. The second ordinance of 1943 defined " service inventions ".

The instructions of 1944 regarding compensation were intended to provide a basis for the calculation of fair compensation, based primarily on the degree of creativeness, the level of remuneration, the functions of the employee in the enterprise and the usefulness of the invention. Assessment of the creativeness of an inventor, for example, was to be based on the type of task or problem placed

[1] If an enterprise wishes to file a patent application for such an invention the application must be accompanied by a declaration given under oath by the management that the enterprise is considered to be the inventor.

[2] The Danish commission drafting the law held that such disputes should be treated by general courts unless the parties agree on private arbitration.

before him, the solution found by him and his position in the enterprise.

In 1957 both chambers of the Federal German Parliament unanimously accepted a draft for a new law with certain changes and amendments.[1] After five years of preparation the Act respecting employees' inventions was issued on 25 July 1957 and came into force on 1 October 1957.[2]

The Act is divided into four main parts and 49 sections. According to section 1 the Act applies to all employees in private and government service, including officials and soldiers. Section 4 defines service inventions, or " bound inventions ", as " inventions made during employment which either (1) have arisen out of the activity of the employee in the enterprise or public administration, or (2) are substantially based on the experience or activities of the enterprise or public administration ". The words " activity of the employee in the enterprise " are interpreted as meaning the sphere of work and duties allotted to the employee. Persons employed in design or development departments, laboratories or experimental stations in a leading research or developmental capacity are presumed to have a duty to " look out for possibilities of improvements and inventions ".[3]

It should be noted that the Act of 1957 does not recognise the concept of " company inventions ", which were recognised in German jurisprudence until 1936.

Two main categories of compensation are distinguished : in case of unlimited acquisition of the right by the employer (section 9 (1)) ; and in case of limited acquisition of the right (section 10 (1)). Section 9 (2) states that, in assessing compensation, consideration shall be given in particular to the economic value of the service invention, the tasks and position of the employee in the enterprise and the degree to which the enterprise has contributed to the invention. Section 11 provides that the Federal Minister of Labour shall issue rules for the assessment of compensation in consultation with the central employers' and workers' organisations. Such rules were issued for employees in the private sector on 20 July 1959.[4] These consist of three parts dealing respectively with (1) computation of the value of the invention ; (2) the " share

[1] The effect of one major amendment was that " suggestions for technical improvements " should be included in the law alongside patentable inventions in cases where they gave the employer a similar preferential (monopoly) position as industrial property rights.

[2] *Bundesgesetzblatt* (Bonn, 1957), Part I, p. 756.

[3] H. SCHADE and H. SCHIPPEL : *Das Recht der Arbeitnehmererfindung*, 3rd ed. (Berlin, 1958), p. 69.

[4] " Richtlinien für die Vergütung von Arbeitnehmererfindungen im privaten Dienst ", in *Bundesanzeiger* (Bonn), No. 156, 18 Aug. 1959.

factor " of the total value of the invention, expressing as a percentage the enterprise's share in the making of the invention, which is to be deducted from the computed total value ; and (3) the actual calculation of compensation (by algebraic formula) as well as modes and periods of payment of such compensation.

As for the time allowed for assessment and payment of compensation, section 12 of the Act provides that the type and amount of compensation shall be fixed " within a reasonable period " after a service invention has been acquired by agreement between employer and employee. If such agreement is not reached the employer may fix the amount of compensation by written declaration and pay this amount. Unless the employee contests this assessment of compensation within two months it becomes binding for both parties.[1]

Protection of service inventions by patent in foreign countries is subject to special provisions (section 14). If the employer has acquired exclusive and unlimited rights he is entitled to file patent applications abroad, but is not obliged to do so. For countries in which the employer does not acquire protection he must release rights in the service invention to the employee.

Nine sections of the law refer to arbitration procedure (sections 28 to 36) and three further sections to court procedure as an avenue of appeal against arbitral decisions (sections 37 to 39).

The Act sets up an arbitration board in the patent office and under its administrative control. This board consists of three members—a chairman and two assessors. The chairman must be a qualified judge, and the assessors are chosen for each case from among the examiners of the patent office as experts in the technical field to which the invention in question belongs.[2] The task of the board is to try to reach an agreed settlement between the parties. If the settlement it suggests is not accepted by the parties the board must issue a written proposal for settlement together with an explanation of its conclusions. The board's procedure is set in motion on written application by one of the parties and its communication by the chairman to the other party, inviting him to reply within a certain period. The parties may agree between

[1] Compensation received by inventors is covered by special income-tax legislation independent of the Act of 1957. Three different ordinances, issued on 30 May 1951, 6 June 1951 and 18 February 1957, deal respectively with income tax for independent inventors, for employee inventors and generally for gratuities received by an employee for suggestions for technical improvements.

[2] The members of the board are selected by the Commissioner of Patents —the chairman for one year, and the assessors for each individual case. On the application of either party the board may be enlarged by the addition of one assessor representing employers' interests and one representing those of employees.

themselves to accept the suggestions of the board as binding. The procedure is unsuccessful if the second party does not file an answer or if he refuses to enter the proceedings (section 35). This underlines the voluntary nature of the board's work.[1]

The common provisions of sections 21 to 27 of the law belong mainly to the domain of general labour law. Section 21 states that one or more " inventions advisers " may be appointed in undertakings especially to help employees to draft their communications about new inventions and, at the request of the parties, to co-operate in the assessment of reasonable compensation.

A general principle of some importance is laid down in section 22, which stipulates that the rights and obligations provided in the Act cannot be set aside by agreement to the disadvantage of the employee, considered to be the weaker party.

Regulation by Judicial Precedents

United Kingdom

No statute concerning employees' inventions exists in the United Kingdom. Since, however, Great Britain was among the first European countries to establish the modern factory system in which the question of employees' inventions arises and to enact a law for the protection of inventions by letters patent [2], the earliest judicial decisions regarding the origin, ownership and use of inventions produced by employee inventors and their compensation date from the beginning of the nineteenth century. Disputes had to be brought before the courts for decision according to common law and the principles of equity. Many of the early questions in this field were answered according to the rules governing relations between " master and servant " and conditions of labour contracts (express or implied) as deduced from the judicial decisions of many centuries' standing.[3]

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[1] Between 1 October 1957 and May 1959, 62 applications were filed ; 90 per cent. of the applicants were employees, of whom the majority had left their position at the time of filing an application. (Statistics supplied by the chairman of the board to the author in 1959.)

[2] By the Statute of Monopolies in 1623. The oldest patent law in Europe, however, was that issued in the Republic of Venice in 1474.

[3] " Many of the present rights and liabilities of both master and servant as between each of them and third persons are to be met with as early as the beginning of the fifteenth century, with the result that the relationship of master and servant still savours in some respects of a status, and not merely a position arising out of a contract. But the rights and liabilities of master and servant as between themselves are substantially the creation of modern law, which has evolved a contract of service many incidents of which are special to that contract." A. S. Diamond : *The Law of Master and Servant*, 2nd edition (London, 1948), Chapter VII, Cf. also F. R. Batt : *The Law of Master and Servant*, 4th edition (London, 1953).

The relevant legislation of the eighteenth and nineteenth centuries did not contain any express provisions referring to rights and obligations of employee inventors. Since the performance of duty by a "servant", according to the definition in British law, often also includes activities of an inventive nature, the rapid development of industry soon gave rise to controversial problems. It is therefore not surprising that some basic questions concerning employee inventors were decided by British courts about 100 years earlier than in other European countries.

Such an early problem concerned, for instance, the authorship of an invention where it had to be decided whether or not the servant was merely carrying out the instructions of his master, being no more than a tool for putting his master's idea into the tangible form which is the subject of a patent.[1] Another basic question analysed and decided by the courts was : Who is a servant ? A skilled chemist, although his employment involved manual labour, was held not to be a servant.[2] A contractor, being a person who has entered into a contract to execute certain specific work, is subject to the orders of his employer only to the extent that the terms of his contract so provide. He is not under the control of his employer.[3] A man may be a servant, although he is employed to do work of a skilful or technical character of which the employer is ignorant, or although he is a member of a class that enjoys a monopoly of the work in question, and whose employment for that work is compulsory[4], or he may be a servant for certain purposes and an independent contractor for other purposes.[5] A managing director of a company is not a servant of the company[6], whereas the secretary of a company might be a servant.[7]

Another relevant question concerns the general duties of a servant and their limits in respect of inventions made by him in the course of his service.[8] The last-mentioned question—the status of (patented) inventions made in the course of work with regard to the nature and scope of employment and the obligations arising therefrom for the employee—was the subject of a series of important

[1] Oldest precedents : *Bloxam* v. *Elsee* (1825) in 1 C. and P. 558, and *Minter* v. *Wells* (1834) in 1 Web. Pat. Cases 132.

[2] *Bagnall* v. *Levinstein Ltd.* (1907) in 1.K.B. 531 ; 76 L.J.K.B. 234.

[3] *Sadler* v. *Henlock* (1855) in 4 E. and B. 570 ; 24 L.J.Q.B. 138.

[4] *Gold* v. *Essex C.C.* (1942) in 2 K.B. at 305.

[5] *Knight* v. *Fox* (1850) in 5 Ex. 721 ; 20 L.J.Ex. 9 ; *Gold* v. *Essex C.C.*, note 4.

[6] In re *Hopkinson* v. *Newspaper Proprietary Syndicate Ltd.* (1900) in 2 Ch. 349.

[7] *Caimey* v. *Back* (1906) in 2 K.B. 746.

[8] *Callo* v. *Brouncker* (1831) in 4 C. and P. 518 ; *Gould* v. *Webb* (1855) in 4 E. and B. 933 ; *Baster* v. *London and County Printing Works* (1899) in 1 Q.B. 901 and later cases.

British court decisions from the turn of the century onwards.[1] The doctrine developed (and affirmed by decisions of recent years) can be described in the following way. A person employed to do his best by his skill, knowledge and inventive powers to improve the manufacture of products made by his employer is, as a rule, a trustee for the employer as to such inventions.[2] An inventor of the above type is entitled to be indemnified by his beneficiaries for any expenses properly incurred. To decide whether or not a particular invention is to be retained by the servant or has been made by him for the benefit of the employer, it was held to be necessary to regard not only the contract of service and the relative positions which the servant and the employer occupy thereunder but the circumstances in which the particular invention was made.[3] The same theme was varied in a number of decisions. It was held that the duty of a draftsman, when instructed by his employer to prepare a design, was to use such skill and inventive faculty as he may possess in order to produce the best possible design within his ability. An invention evolved as a result of instructions given to an employee by his employer and in the discharge of his duty belongs to the employer.[4] The courts often held it to be a part of the terms of employment, apart altogether from any express covenant, that any invention or discovery made in the course of employment and in doing what the employee was engaged and instructed to do during the period of his employment, during working hours and using the materials of his employers, is the property of the employer, the employee being as a trustee bound to give the benefit of it to his employer.[5] Also a managing director making an invention relating to the company's business was held a trustee of the invention and the patent for the company.[6]

Typical of English and American law is the fact that entire agreements or certain clauses of service agreements can be legally void as being " in restraint of trade ". For instance a stipulation that all inventions made by an employee at any time should become the property of the employer and for a period not limited by reference to his service are held to be unreasonably wide and unenforceable.[7]

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[1] Oldest basic precedent : *Worthington Pumping Engine Co.* v. *Moore* (1902) in 20 Report of Patent Cases (abbreviated RPC) 41.

[2] *Edisonia Ltd.* v. *Forse* (1908) 25 RPC 546 ; *British Reinforced Concrete Engineering Co. Ltd.* v. *Lind* (1917) 34 RPC 101.

[3] Ibid.

[4] *Adamson* v. *Kenworthy* (1931), 49 RPC 57.

[5] *Triplex Safety Glass Co. Ltd.* v. *Scorah* (1937), 55 RPC 21 ; *Barnet Instruments Ltd.* v. *Overton* (1949) 66 RPC 315.

[6] *Barrington Products (Leicester) Ltd.* v. *King* (1958), 75 RPC 212.

[7] *Electrical Transmission Ltd.* v. *Dannenberg* (1949), 66 RPC 183.

All the court decisions which together embody the law in force in Great Britain in this field cannot be reported here. Reference must, however, be made to another source of guidance which has been available since 1949. The court decisions mentioned show that the inventions in question are declared to belong either wholly to the " master " or wholly to the " servant ". No division of rights and benefits between the parties was considered. This deficiency was removed in 1949 by the introduction of a new section into the Patents Act (section 56). This section empowers the Comptroller-General of the Patent Office, upon application in a dispute between an employer and an employee, to determine by order the apportionment between them of the benefit of the invention, unless he is satisfied that one or other of the parties is entitled to it, to the exclusion of the other. Up to the end of 1958, 20 applications had been made to the Patent Office under section 56.[1] Three of the allowed cases were published.[2]

Independently of ordinary court jurisprudence, the law relating to employee inventors appears to have been substantially influenced by the needs of two World Wars, when a number of government departments were obliged to commandeer inventions needed for the defence of the country and for war production, the majority of which were produced by officials and employees of different military and other agencies. The questions of compensation and awards for patented inventions of this kind used by the Crown were first turned over to a Royal Commission on Awards to Inventors, created by a Royal Warrant in 1919. This administrative body had necessarily to analyse a great many situations and to settle terms very similar to those dealt with by arbitration boards created by general or special law in other countries (e.g. in Germany, Sweden or the United States). Further (temporary) Royal Commissions on Awards appointed in 1920, 1946 and 1947 were in 1956 replaced by a Central Award Committee, created to assess awards for inventions used by the Crown and as an appeal instance in disputes regarding the division of benefits derived from the use of inventions of major importance made by civil servants of different categories.[3] To give some idea of the extent of work done it may be mentioned

[1] Of these applications seven were withdrawn, six were allowed, three abandoned, one refused and one not entertained as appropriate.

[2] In the matter of an application to the Comptroller-General by the Loewy Engineering Co. Ltd. (1951), 69 RPC 3 ; in the matter of Charles Selz Ltd.'s application to the C.G. (1953), 71 RPC 158 ; *Patchett* v. *Sterling Engineering Co. Ltd.* (1935-55), 70 RPC 184 at 195, 71 RPC 61 at 72 and 75, and 72 RPC 50 at 52, 57 and 58.

[3] The reports of the first Commission of 1919-20 were officially summarised in 1929 by the Treasury, and the principles governing assessment of compensation stated for inventors in military service or in the employment of government departments.

that approximately 1,300 claims were referred to the Royal Commission of 1946 for decision. The opinions and statements of these bodies seem, however, not to have the same character of generally binding precedents as those issued by courts. The possible interaction of decisions made by courts, the Comptroller-General of the Patent Office (under section 56 of the Patents Act) and the Royal Commissions is not known to the author. A co-ordination of the total body of opinions, statements and decisions would no doubt bring Great Britain into line with the most modern and highly developed countries in this field of law.

United States

The notion of regulating the main questions concerning salaried inventors by means of unified federal legislation is entirely unfamiliar to United States industry, and has been championed neither by organisations of employers nor by those of workers. The wide differences in employment, working conditions, wages, engineering methods, research and development prevailing in different parts of the largest industrial nation in the world make the establishment of uniform practice, and even the task of ascertaining the actual practice of individual enterprises, extremely difficult.[1]

For over 100 years United States courts have been handing down decisions regarding employees' inventions. These decisions have not, however, been codified in such a way that the general rights and obligations of employers and employees in this matter can be indicated with any certainty. More than 100 precedents exist, however, some of which have been several times affirmed by higher courts, so that they can today be considered to be valid and actual law.

The only general legal rule in force is that, according to section 115 of the Patent Act of 1952, only " the original and first inventor " may file a patent for an invention, this rule representing a principle of personal ownership of inventions taken over by the United States from British law.

As early as 1843 the precedent was established that an employer always had an irrevocable, royalty-free licence (non-exclusive) for an invention made by an employee in the course of employment and at the expense of the employer, and for which the inventor had given his tacit or explicit consent.[2] This type of licence is commonly

[1] An inquiry into the practice of some 50 large enterprises was made by the National Industrial Conference Board in 1952.

[2] *McClurg* v. *Kingsland*, 1 How. 202, 11 L.Ed.102 (1843) ; *Hapgood* v. *Hewitt* 119 U.S. 226, 7 S.C. 193, 30 L.Ed. 369 (1886) ; as to the rule of consent by the inventor : *Solomons* v. *U.S.* 137 U.S. 342, 11 S.C.88, 34 L.Ed. 667 (1890 ; *Tin Decorating Co.* v. *Metal Package Corp.* 29 F. 2d 1006 (S.D. N.Y. 1928), cert. denied 281 U.S. 759 (1930).

called a " shop right ". The nature, scope and limits of such shop rights to inventions made in employment have, for a long time, been the central questions of decisions by United States courts. For such a right of use to exist, the employer's contribution must have been directed specifically to the invention in question.[1] Another condition is that the employee has made use of his employer's time, employees, materials or appliances.[2] On the other hand, neither the fact that the invention was made during working hours or with facilities belonging to the employer, nor the extent of such use is critical.[3] A shop right does not come into being if an employee refuses the employer's offer to contribute [4], if the contribution is reimbursed by the inventor to the employer [5], or if contribution was made after the invention was perfected.[6] The same is true if the invention falls outside the scope of the inventor's employment.[7] The right of use by the employer in the form of a shop right does not deprive the employee of the title to his invention or to the patent granted for it.[8]

The precedents cited above are but a few examples of the manner in which the law of shop rights has been built up through the years. In a similar way a body of law has been determined concerning inventions made during employment and the right to which is not limited to a right of use, but belongs entirely to the employer. This is the case, for example, if an employer contributes the general principle or plan of the invention and the employee no more than the mechanical skill to give it form.[9]

Basic for the right of ownership of the employer to inventions made by employees in the United States is the doctrine founded by the classical case *Agawan Woolen Co.* v. *Jordan* handed down in

[1] *Fort Wayne, C. and L.R. Co.* v. *Haberkorn*, 15 Ind.App 479, 44 N.E. 322 (1896).

[2] *U.S.* v. *Dubilier Condenser Corp.*, 289 U.S. 178, 53 S.C. 554, 77 L.Ed. 1114 (1953). This Supreme Court decision is also basic for the legal position of civil servants as inventors.

[3] *Callahan* v. *Capron Co.*, 280 F. 254 (D.R.I. 1922) and *Jencks* v. *Langdon Mills*, 27 F. 622 (D.N.H. 1886).

[4] *Gemco Engineering and Mfg. Co. Inc.* v. *Henderson*, 151 Ohio St. 95, 84N.E. 2d 596 (1949).

[5] *Doscher* v. *Phelps Guardant Time Lock Co.*, 89 Misc. 561, 153 N.Y. Supp. 710 (1915), affirmed (1915) and (1918).

[6] *Fort Wayne, C. and L.R. Co.* v. *Haberkorn*, see above.

[7] *Reece Folding Machine Co.* v. *Fenwick*, 140 F. 287 (C.C.A 1st, 1905); *Massie* v. *Fruit Growers' Express Co.*, 31 F. 2d 463 (D.Del. 1929).

[8] *National Development Co.* v. *Gray*, 316 Mass. 240, 55 N.E. 2d 783 (1944); *Marshall* v. *Colgate-Palmolive-Peet Co.*, 175 F. 2d 215 (C.C.A. 3d, 1950), 86 U.S.P.Q. 118 (1950); *Pressed Steel Car Co.* v. *Hansen*, 128 F. 444 (W.D. Pa 1904), affirmed 137 F. 403 (C.C.A. 3d, 1905); *Bensley* v. *Northwestern Horse-Nail Co.*, 26 F.250 (N.D. Ill. 1886).

[9] *Pembroke* v. *Sulzer*, 265 F. 996 (C.A.D.C. 1920); *Lewis* v. *Strom*, 285 F. 985 (C.A.D.C. 1923); *Owens* v. *Sponable*, 69 F. 2d 650 (C.C.P.A. 1934).

1868.[1] It was held in this case, among other things, that a patent belongs to the employer if he has delegated to his employee the practical execution of an idea through the exercise of the latter's workmanship and mechanical skill, in which case the work of the employee is considered " ancillary and in aid of the invention ". A host of other court decisions, which cannot be reported here, supplement these basic conceptions concerning employees' inventions, which are considered to be valid law, unless overruled.

Another broad field covered by judicial precedents, dating from the 1880s, is that concerning the construction and interpretation of the provisions of employment contracts—written, oral or implied—regarding employees' inventions. In the United States such agreements must be founded on actual and valuable consideration. Typical of United States law is the fact that the strict rules regulating free competition, as laid down in the so-called anti-trust laws, must be observed also in connection with agreements concerning all kinds of inventions. Violation of the anti-trust laws may exist if contract provisions contain unreasonable restraints in terms of time, space or subject-matter.

During the 1940s the question of employees' inventions began to appear in certain collective bargaining contracts, for instance in the mechanical and electrical industries, but the number of such agreements seems still to be very small in view of the total size of United States industry.[2]

The lack of interest evinced in the United States in any general legal regulation of the question of employees' inventions in the private sector is not carried over into the government sector. In 1943, on the instructions of President Roosevelt, the Department of Justice worked out an extensive study of government patent practices in connection with government research, inventions made by government employees and contractors, as well as the administration of systems of rewards to employees. In his final report on the subject[3], the Attorney-General made a series of recommendations which resulted in the issuance, on 23 January 1950, of an executive order by President Truman establishing a Government Patents Board, consisting of a chairman appointed by the President and ten representatives from different departments and commissions for liaison purposes.[4] The duty of the Board is to advise and

[1] 7 Wall. 583, 19 L.Ed. 177.

[2] For a collection of examples see *Collective Bargaining Negotiations and Contracts* (Washington, Bureau of National Affairs, 1948).

[3] *U.S. Department of Justice : Investigation of Government Patent Practices and Policies*, Vols. 1-3 (Washington, 1947).

[4] Executive Order 10096 providing for a uniform patent policy for the Government with respect to inventions made by government employees and for the administration of such policy, in *Federal Register*, Vol. 15, No. 16, 25 Jan. 1950, pp. 389 ff.

confer with its chairman, who is responsible for administering, interpreting and enforcing a uniform government patent policy and settling any controversies arising in connection with it. Between 1950 and 1958 the Government Patents Board had three chairmen and rendered 2,357 decisions, of which 2,333 arose from the automatic review of the decisions of government agencies and 24 from appeals to the chairman of the Board from the decisions of these agencies.[1] A lack of co-ordination among government agencies in their treatment of inventions made by employees was revealed by a recent report of the Subcommittee on Patents of the United States Senate, which drew attention to the urgent need for legislative action to resolve policy differences among the members of the Patents Board.

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[1] For details see C. M. DINKENS: " Patent Practices of the Government Patents Board ", in *Preliminary Report of the Subcommittee on Patents, Trade-marks and Copyrights of the Committee on the Judiciary, United States Senate, 86th Congress, First Session, pursuant to S. Res. 53* (Washington, 1959).

REPORTS AND INQUIRIES

Some Aspects of the International Migration of Families

The growth of government-sponsored migration schemes since the war and the increasing concern of intergovernmental and non-governmental bodies with migratory movements have led to widespread consideration of the effects of such movements on the migrants and the countries of departure and destination. In this context particular attention has been paid to questions related to the international migration of families, some of which are considered in the following article. The article draws attention to current trends of opinion concerning family migration and to some of the factors which influence government policy in this respect. It describes post-war steps to facilitate the migration of family groups or to reunite families separated by migration. In conclusion it attempts to assess briefly the progress made since the war and to indicate the need for further action.

Every year countless human beings plan to leave their homeland—or, if they are refugees, their country of temporary asylum—and settle permanently in another country. Many of these prospective emigrants are breadwinners whose plans naturally take their dependants into account. One of the main questions to be decided is whether all members of the family are to emigrate together or whether the breadwinner is to go alone and be joined by his dependants later. The decision depends on a number of factors.

In the most fortunate cases the family emigrates as a unit. This is possible only when there are no financial, legislative or other obstacles to family migration or when the family receives the assistance necessary to overcome such obstacles as may exist.

In other cases, although there is nothing to prevent all the members of a family from emigrating together, they may decide voluntarily to accept a brief period of separation. This decision may be taken in order to give the breadwinner a chance to assess the prospects of successful settlement in the country of destination before committing his family as a whole to so important a venture. Alternatively, it may be based on a feeling that settlement will be easier if the breadwinner has time to find a suitable job and accommodation before sending for his dependants.

Often, however, the decision to separate is forced upon the family. In some cases the breadwinner has not the money to pay for the whole family's journey to the immigration country and to make a home for them there immediately. He therefore leaves his dependants behind and emigrates alone with the intention of saving enough from his earnings to enable them to join him as soon as possible. In other cases separation is

the consequence of certain requirements laid down by the immigration country. Some countries, for instance, do not authorise the admission of a foreign worker's dependants until the worker can provide evidence that he has secured suitable accommodation for them or that he is in stable employment. The tragedy of these forced separations is that they often drag on indefinitely. Many breadwinners find that the expense of maintaining themselves in one country and their dependants in another makes saving difficult or impossible and thus dashes their hopes of speedy family reunion. Others are unable, because of a housing shortage in the immigration country, to find the accommodation which is a prerequisite for the admission of their dependants.

Finally, there are the families that have to abandon their emigration plans either because the family as a whole fails to meet the admission criteria of the immigration country or because one or more of its members are declared inadmissible and the family is unwilling to face permanent separation. Many of these suffer bitter disappointment, for they had seen in emigration the hope—sometimes their only hope—of a better life.

In view of the important human issues involved it is not surprising that family migration is a subject of close and constant concern to governments, intergovernmental organisations and non-governmental bodies representing various sectors of opinion in many countries. Discussion and study of this subject cover a wide range of questions, including the various forms of assistance and protection to be afforded to families at all stages of the migration process and the social benefits to which they should be entitled in the immigration country. In general, however, particular emphasis is placed on the following two important questions of principle : the need to avoid disrupting the family group through migration ; and the need for wider opportunities for migration of families. It is these questions, and the factors directly related to them, that are considered below.[1]

At this point it may be asked what is generally meant by the term " family " as used in connection with international migration. Although no official definition exists, the term is widely interpreted to mean a group comprising a husband and wife and their minor children. This interpretation is sometimes extended to include other dependent relatives.[2] Some immigration countries have gone further and adopted

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[1] In connection with the first question, namely the need to avoid disrupting the family group through migration, the following explanations appear necessary :

First, seasonal migration has been excluded from the scope of this article. Such migration is, admittedly, a frequent cause of splitting family groups. Workers migrating to take up seasonal employment in another country are generally not permitted to take their dependants with them ; nor is it likely that many of them would do so even if they could, since they wish to maintain homes in their countries of origin. Temporary disruption of the family group therefore appears to be an inevitable, albeit regrettable, consequence of seasonal migration.

Secondly, families are often separated from their breadwinners through migration which, although of much longer duration than seasonal migration, cannot always be deemed permanent. Protracted separations of this kind are common in Africa south of the Sahara, where indigenous workers leaving tribal lands without their families to take up paid employment in neighbouring territories account for some of the largest migratory movements in the world. The social, economic and psychological factors which make it difficult to avoid such separations at the present time have been described in " Inter-Territorial Migrations of Africans South of the Sahara ", in *International Labour Review*, Vol. LXXVI, No. 3, Sep. 1957, pp. 292-310. They are therefore not mentioned in this article.

[2] Paragraph 15(3) of the Migration for Employment Recommendation (Revised), 1949, states in this connection : ". . . the members of the family of a migrant for employment should include his wife and minor children ; favourable consideration should be given to

provisions designed to facilitate the admission of certain non-dependent close relatives of immigrants.

The Case for Family Migration

In May 1950 the I.L.O. Preliminary Migration Conference, at which 29 governments were represented, stated in its conclusions that every possible effort should be made by countries of emigration and immigration, as well as by the international organisations concerned, to prevent the involuntary splitting of family groups through the migration of their members and that if separation was inevitable its duration should be limited to the shortest possible period.[1] In June 1959 the Seventh International Conference of Non-Governmental Organisations Interested in Migration, which was attended by the representatives of 67 international and national non-governmental bodies, adopted a resolution concerning the protection of the migrant family in which it recommended to governments that the principle of the inviolability of the family unit should be respected and that emigration of families should be preferred to individual emigration.[2] Similar views have been expressed by the International Confederation of Free Trade Unions, the International Federation of Christian Trade Unions and other bodies concerned with international migration or with questions related to the preservation of family life.[3]

There is thus a widely held opinion, both in official and unofficial circles, that all members of a family should emigrate together or, failing this, that they should be reunited in the immigration country as soon as possible. This opinion appears to be founded largely on two beliefs, namely that prolonged separation of the members of a family has unfortunate moral, social or economic consequences, and that the presence of a breadwinner's family in the immigration country facilitates his integration. To what extent does experience justify these beliefs?

Possible Consequences of Separation

There is indeed ample evidence that prolonged separation due to circumstances such as those already mentioned places a strain both on

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requests for the inclusion of other members of the family dependent upon the migrant." The draft Regulations concerning the free movement of workers between the States Members of the European Economic Community, which will shortly be considered by the Council of Ministers of the Community with a view to the adoption of a final text, embody a similar conception of the family. Article 10 of the draft states: "The wife and children under 21 years of age of a worker who is a national of a member State and who is regularly employed in the territory of another member State shall be allowed to join him there. Each member State shall facilitate the admission of any member of the family who is wholly or partly dependent on the worker and lives under his roof." (*Journal officiel des Communautés européennes* (Brussels/Luxembourg, Service des publications des Communautés européennes), 3rd year, No. 71, 16 Nov. 1960, p. 1393.)

[1] See *Industry and Labour* (Geneva, I.L.O.), Vol. IV, No. 1, 1 July 1950, p. 45.

[2] Ibid., Vol. XXIII, No. 5, 1 Mar. 1960, p. 167.

[3] In June 1957, for example, the Triennial Meeting of the International Council of Women passed a resolution requesting governments and intergovernmental and non-governmental organisations to do all in their power to reduce the interval between the emigration of the head of a family and that of his dependants. In September of the same year the general assembly of the International Union of Family Organisations adopted a resolution urging that migrant workers be permitted to take their dependants with them or, where this was not possible, that the appropriate national and international bodies endeavour to remove obstacles to family reunion and ensure that the period during which an emigrant was separated from his dependants did not exceed six months.

the emigrant and on his dependants who have remained behind. The emigrant is deprived of the moral and material comforts of family life during the difficult phase of initial adjustment to living and working conditions in a strange land, while his wife is obliged to shoulder alone the burden of running the home and bringing up the children. The children themselves inevitably suffer from the lack of a father's care and guidance, and the splitting of families through the emigration of the breadwinner has in fact been cited as a factor contributing to the growth of juvenile delinquency. The strain is increased when, as often happens, the period of separation is also a period of financial hardship for all members of the family owing to the fact that the emigrant must maintain two homes and, at the same time, endeavour to save enough to send for his dependants.

The frustration and discouragement caused by this situation sometimes weaken the marriage bond and lead the emigrant or his wife to form new attachments. The family unit is then permanently disrupted and in some cases the emigrant may even abandon his dependants in the home country and make no further effort to support them.[1]

On the other hand, family ties may be strong enough to induce an emigrant to return home if his dependants cannot join him in the immigration country within a reasonable period. Although his return in such circumstances preserves the family unit, it may mean the renunciation of hopes of a better future for the family as a whole. Moreover, it represents a complete waste of the efforts previously made by the emigrant —and sometimes by the governmental or other bodies which have assisted him—to ensure the success of his migration.

The Family as a Factor in Integration

Since prolonged separation from his dependants may thus have an unsettling effect on the head of the family, it would seem, conversely, that their presence in the immigration country should facilitate his adjustment to conditions there and consequently pave the way for the successful integration of the family as a whole. Many persons and

[1] It was partly with a view to alleviating the suffering of dependants abandoned in these circumstances that the United Nations Conference on Maintenance Obligations adopted, on 20 June 1956, a Convention on the Recovery Abroad of Maintenance (see *Industry and Labour*, Vol. XVI, No. 10, 15 Nov. 1956, pp. 423-424). In the course of the preparatory work which led to the adoption of the Convention, the position of these dependants was described by the International Social Service in the following terms: "Before the Second World War, most of the women who asked our help in securing maintenance from abroad were living in their own countries. Their husbands had emigrated to settle in a new country and in the majority of cases expected to send for their families as soon as they could afford it. Under these circumstances a woman accepted temporary economic hardship, believing that the husband was saving every penny towards establishing a new home for the family. But it took time for a foreigner to save enough to bring the family to the new country. Immigration restrictions, economic depressions and prevention of travel because of war contributed to keeping families separated. Ties became weakened, correspondence lessened and often ceased altogether. Frequently the men formed new family ties, having become discouraged at separation that was often beyond their control. Their wives were left with the full burden of supporting their children, who often suffered serious deprivation. Mass displacement of persons which occurred during and after the war has greatly increased the number of separated families. In some of these families the men have gone ahead with work contracts, accepted in many cases as the only hope of supporting their wives and children in the future. Some of these men have failed to make provision for their families, leaving them abandoned, often in the barren hopelessness of refugee camps." (United Nations, Economic and Social Council, Official Records, Seventeenth Session (New York, 1954), Annexes XVII(17), p. 12: *Statement of the International Social Service* (document E/AC.39/1/Add.1)).

bodies concerned with the integration of immigrants maintain that this is what actually happens.

In the first place it has been noted that the presence of an immigrant's family gives him an added incentive to succeed in his job. Some employers who have tried by various means to facilitate the occupational adjustment of immigrant workers have found that the most effective way of doing this is to help them bring their dependants to the immigration country. In such cases the installation of the family has been seen to correspond with an improvement in the immigrant's work performance and an increase in his interest in his job. The family's role in this connection cannot be overestimated, because occupational adjustment is one of the first steps in the process of integration ; it is also perhaps the most important, since it gives the immigrant the economic security which is a prerequisite for successful integration.

Secondly, experience has shown that the children of immigrants play a considerable part in the integration of their parents. This is attributed to the fact that children, because they are at an impressionable stage in their lives, are more readily influenced than adults by the environment of the immigration country. In consequence, they bring into the home and pass on to their parents many of the habits and attitudes—and sometimes the language—of the local population, which they have acquired at school or at play.

On the other hand, it has been recognised that the family of an immigrant may retard integration if they continue to pattern their home life solely on the traditions and habits of the country of origin and thus isolate breadwinner and dependants alike from the receiving community. It has also been recognised, however, that integration cannot be achieved by forcing immigrants immediately to abandon all features of the way of life to which they have been accustomed and that the persistence for a time of some of these features may even help them through the difficult transition period and thus, in the long run, facilitate integration. Successful integration is in fact seen to be not the mere assimilation of the immigrants by the receiving community but rather the outcome of a gradual process of mutual adjustment as between the immigrants and the members of that community.

All these different aspects of the effect of the family on integration have received the close attention of U.N.E.S.C.O., the international agency directly concerned with problems relating to the cultural integration of immigrants. The U.N.E.S.C.O. Conference on Cultural Integration of Immigrants which met in Havana in April 1956—and which brought together representatives of 17 governments, and of intergovernmental and non-governmental organisations, as well as a number of specialists on integration—was faced with the following question : If, on grounds of social justice, the maintenance of family unity is taken to be a major objective of immigration policy, will such a policy also facilitate integration ? The reaction of the conference has been summed up in the following terms :

> The Havana Conference adopted a realistic attitude by deciding in effect that this was not a fair question. The conference's view was that modern immigration must be based upon the principle of family unity and that therefore any special problems arising out of such a policy had to be dealt with.[1]

[1] W. D. Borrie : *The Cultural Integration of Immigrants.* A survey based upon the Papers and Proceedings of the U.N.E.S.C.O. Conference held in Havana in April 1956 (Paris, U.N.E.S.C.O., 1959), p. 120.

This reaction found expression in the following recommendation of the conference :

> That full attention be given to the importance of the family unit in immigration and as a factor in integration. The family can play a major role in the capacity of its members either to integrate quickly or to persist in customs alien to the society of the receiving country ; accordingly, the objective in assisting integration should be to encourage adjustment of the family without destroying its basic structural pattern.[1]

Considerations Influencing Government Policy

Since the war a number of intergovernmental conferences have adopted texts referring to family migration. These texts, some of which have been quoted above, show that governments of many emigration and immigration countries support the principle that all members of a family should be able to emigrate together or be reunited in the immigration country without undue delay. Many of the statements on migration which have been made from time to time by government representatives reflect the same point of view, and much has been done by governments in recent years to further the application of the above-mentioned principle. It is nevertheless true that government requirements sometimes hinder or prevent its application, with the consequences already described.

This apparent inconsistency in the attitude of governments arises from the fact that, while support of the principle of family migration may sometimes be inspired solely by moral or human considerations, national migration policies must generally take account of a number of other factors. Some of these are outlined in the following pages.

Immigration Countries

Since it is the immigration countries that make the decision for or against admission of the prospective migrant and his family, their policies are of the first importance.

These countries generally seek to admit only persons who may be expected, either immediately or in later years, to make a normal contribution to the economic life of the receiving community. The health requirements which they lay down for immigrants are therefore designed to exclude persons suffering, or having suffered, from certain diseases or disabilities considered likely to affect their prospects of earning a living. Although exceptions may sometimes be made, subject to the provision of a guarantee that the person concerned will not become a public charge, health requirements do constitute an obstacle to family migration in many cases. Whole families have sacrificed an opportunity to emigrate rather than leave a sick or disabled member behind. This has happened frequently in the case of refugees, who include a higher proportion of sick and disabled persons than do migration candidates generally. Moreover, the consequences have often been particularly tragic for refugee families, because failure of one of their members to qualify for acceptance by an immigration country has condemned the family as a whole to a further indefinite period of bleak existence in a refugee camp.

[1] United Nations Educational, Scientific and Cultural Organisation : *Report by the Director-General on the Conference on the Cultural Integration of Immigrants*, Havana, Cuba, 18 to 27 April 1956, document UNESCO/SS/16 (Paris, 13 August 1956).

Sometimes the fact that one member of a family is unacceptable for health reasons is discovered only when the dependants seek to join the breadwinner who has emigrated previously. The family is then faced with the difficult choice between permanent separation of its members and the return of the breadwinner.[1]

However, provided that the dependants of a breadwinner who has been accepted with a view to permanent settlement meet the health standards and the standards of morality and conduct laid down for admission, immigration countries generally raise no permanent obstacle to their entry. Indeed, as already indicated, they favour the admission of families in such circumstances on moral and human grounds. Sometimes, moreover, they welcome or even actively encourage it for other reasons.

Some countries, for instance, see in family immigration a means of helping to achieve the rapid and balanced population growth required for their social and economic development. Australia is a case in point. Here and in other countries it is recognised, too, that the growing children of immigrant families will, in a relatively short time, help to provide the increased labour force needed for industrial expansion. In the event of migration for land settlement, families with older children are preferred to single migrants, and certain countries of Latin America have encouraged the admission of European farming families of this type for settlement purposes. Recently, too, some countries have come to appreciate the contribution which immigrant families can make to national well-being in a rapidly developing economy as consumers whose demand for certain goods stimulates production and creates wider home markets.

Nevertheless, certain features of the national economic or social situation may temporarily prevent an immigration country from encouraging family migration or oblige it to subject the admission of whole families, or that of dependants of breadwinners already in the country, to certain conditions.

During the early post-war years, for example, the urgent need for certain categories of workers and the limited transport facilities available obliged some immigration countries to give priority to such workers in their immigration programmes, to the detriment of family migration.[2] In New Zealand these factors caused the Government to restrict even the free and assisted passage schemes for British migrants, until 1951, to single persons willing to accept employment in certain specified occupations. Another cause of this restriction was the housing shortage in New Zealand.

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[1] With a view to avoiding this situation, some immigration countries insist on examining all members of a family at the same time, even if the breadwinner intends to emigrate in advance of his dependants.

[2] This was true even of Australia, a country which, as already pointed out, attaches considerable importance to family migration. The situation in that country and its subsequent evolution have been summed up by the Australian Minister of Immigration as follows: "A basic principle of post-war immigration planning has been that family 'migration' is 'good migration'. Whilst in recent years it has been possible to concentrate on the introduction of families, this has not always been the case. For instance, in the early years of the post-war schemes it was necessary to introduce a number of single male workers to meet the labour demands of Australia's essential industries.... With the greater degree of balance which has subsequently been achieved between the supply and demand for labour and the gradual overtaking of war-caused backlogs in the essential industries, it has been possible to reduce the emphasis on the worker component of the migrant intake and to restore family migration to its proper place." (Commonwealth of Australia: *Parliamentary Debates*, Senate, 26 Mar. 1958, p. 362.)

Even today the lack of housing in some immigration countries constitutes a serious obstacle to family migration. In France, for example, a country which has taken steps to encourage the reunion of immigrant workers and their families, the Government requires proof that suitable accommodation is available for dependants before it will authorise their admission. This requirement—which exists in other immigration countries too (for instance, Belgium and the Federal Republic of Germany)—is obviously necessary to avoid overcrowding and the social evils it may engender. The fact remains that it has prolonged the separation of many families and led to the return home of immigrant workers whose services were needed and who might otherwise have settled permanently.

The extent to which a country is able to overcome its housing difficulties and provide accommodation for immigrant families depends partly on the funds available for housing construction. However, the acceptance of immigrant families on any appreciable scale implies increased expenditure not only on housing but also on the construction of schools, the extension of public services and the provision of the various social benefits which many countries today grant to immigrants and nationals alike. Some of the less developed immigration countries lack the necessary funds for large-scale social investment of this kind and are obliged to give priority, in the allocation of their scant resources, to basic economic development needs. Moreover, the admission of large numbers of persons who are solely consumers, although it may prove beneficial in more favourable circumstances, brings a threat of inflation to an economy whose low production makes it unable to cope with a rapidly increasing demand for consumer goods.

Thus the attitude of a country to the admission of an immigrant's dependants is closely linked with its economic and social situation and may vary with changes in that situation. But the prospects of countless families contemplating migration are affected not only by the attitude of potential receiving countries to family migration as such but also the considerations on which their general immigration policy is based.

In the first place, some governments consider that immigrants whose cultural or ethnic background is similar to that of the majority of the nationals of the receiving country are more likely than others to become successfully integrated. They therefore show a preference for such immigrants, which may be expressed in different ways. In the United States it is reflected in immigration legislation which places no restriction on the number of visas that may be issued annually to natives of Western Hemisphere countries and allocates more than 70 per cent. of the total annual immigration quota for all other areas to persons born in the United Kingdom, Germany and Ireland, leaving the remaining thirty per cent. to be divided, in widely varying proportions, among persons from more than 80 areas. The laws or regulations of some Latin American countries establish distinctions between prospective immigrants on the basis of their cultural or ethnic background by means of a quota system, the specific exclusion of persons of certain races or nationalities or the expression of a general preference for immigrants of European origin. Countries of the British Commonwealth have an avowed preference for British immigrants, which is evidenced in some cases by the exemption of such immigrants from certain requirements imposed on aliens and in others by the particularly high degree of financial assistance accorded to British citizens for migration purposes. As a result of these preferences many families are debarred, merely

because of their national or ethnic origin, from emigrating to the country where they would like to settle. Other families must wait a very long time for an opportunity to emigrate as a unit or to be reunited in the country of their choice, because it admits each year only a limited number of persons belonging to their national or ethnic group or gives priority in some other way to families belonging to more favoured groups.

Secondly, the need of some immigration countries for skilled workers obliges them to give priority to the admission of such workers and their families or to restrict assisted migration to such persons. By comparison, the emigration opportunities available to families whose breadwinner is unskilled are very limited indeed.

However, it must be mentioned that some immigration countries have accepted an appreciable number of refugee families in recent years. In so doing, they have sometimes allowed humanitarian considerations to outweigh the various economic and social considerations which normally form the basis of their policies with respect to immigration generally and the immigration of families in particular.

Emigration Countries

The factors determining the attitude of emigration countries are less complex. Their support for family migration and the reunion of separated families is in consequence more consistent.

This support, like that of immigration countries, is based firstly on moral and human considerations. These are strengthened, in the case of emigration countries, by the fact that the families seeking to emigrate as a unit or to be reunited are composed mainly of their own nationals, whom they have a special responsibility to protect.

Moreover, the possible temporary or long-term financial implications of family separation for the emigration country have to be taken into account. Some time may elapse before an emigrant is able to send a first remittance to his dependants, who may have to appeal to the authorities of the emigration country for assistance.[1] Prolonged separation may, as already mentioned, lead to the abandonment of the dependants who have remained behind. In that event the emigration country is left to cope with the burden of providing schooling and other facilities and, possibly, material assistance over a relatively long period to persons whose breadwinner has ceased to make any compensating contribution to its economy, either as a producer or through the remittance of funds from abroad.

However, emigrants who abandon their dependants obviously constitute a minority. The majority continue to send home remittances the total amount of which undoubtedly has a beneficial effect on the balance of payments of the emigration countries concerned. Nevertheless, and while not denying the advantages which their national economies derive from the funds transferred as a result of family separation, emigration countries continue to press for speedy reunion of families. Their attitude in this respect is summed up in the following statement recently made by a representative of the Italian Government : " Italy, a nation which is deriving notable advantages from these

[1] In Italy, under a decree of 23 August 1946, the dependants of an emigrant who are in need may be granted special financial assistance by the authorities for 45 days or, in exceptional circumstances, for up to 120 days.

remittances, . . . subjects such national interests to the higher interests of the happiness of her sons disseminated throughout the world." [1]

Emigration countries must also bear in mind that if there is an unduly high proportion of young single workers among the persons leaving their territory for permanent settlement abroad the result will be an increase in the proportion of unproductive or less productive elements, that is to say children and older persons, in their national population, and a consequent strain upon the economy. This consideration, too, causes them to favour the emigration of families, which constitute a fairly representative cross-section of the different age groups making up the population.[2] It is a consideration which has been taken into account by the British Oversea Migration Board, the body responsible since 1953 for advising the United Kingdom Government on schemes for emigration. In urging, in its first report, that the Government continue to participate financially in the assisted passage scheme for emigration to Australia, the Board stated—

> We consider that the argument that emigration is harmful to the United Kingdom economy is valid only if the migrants contain an unduly high proportion of the young and highly skilled .... The continued subsidy to fares given by the assisted passage scheme would help to ensure the maintenance of a balanced migration of young, working and old .... The operation of a joint scheme by the United Kingdom and Australian Governments in collaboration would, as in the past, make it easier to enlist the help of the Australian immigration authorities in taking a fair cross-section of the population, including family groups.[3]

These statements do not merely indicate support for family migration on economic grounds. They also show recognition of the fact that participation by the government of an emigration country in the cost of migration schemes may serve to increase the proportion of family groups in the emigration flow. In other words, one of the many factors affecting a family's migration prospects is the extent to which its country of origin is able and willing to translate its general approval of family migration into practical action.

Sometimes, however, the authorities of an immigration country may prevent the departure of a breadwinner, whether alone or accompanied by his dependants, if they consider this to be necessary in the interest of the persons concerned. Such a step may be taken, for instance, if the breadwinner's degree of occupational skill is not sufficient to ensure a decent standard of living in the immigration country or if the living and working conditions offered by that country are below what is considered to be an acceptable minimum.

Recent Developments

The situation thus presents both encouraging and discouraging features. On the one hand, there is a strong body of opinion in favour

[1] Speech made by His Excellency M. Carmine de Martino, Under-Secretary of State for Foreign Affairs of Italy, at the 87th meeting of the Council of the Intergovernmental Committee for European Migration on 9 April 1959, document MICEM/8/1959 (mimeographed).

[2] A regulation recently laid down by the Government of Pakistan is of interest in this connection. It stipulates that the number of unmarried men, or men unaccompanied by their wives, who are assisted to emigrate in any one year shall not exceed one-fifth of the total number of emigrants for that year.

[3] *First Annual Report of the Oversea Migration Board*, July 1954, Cmd. 9261 (London, H.M. Stationery Office, 1954).

of family migration; on the other, as a result of some of the factors just mentioned, many families find themselves in the distressing circumstances outlined at the beginning of this article. On balance, however, developments since the war provide some grounds for optimism.

In the first place, the principle that members of a family should emigrate together or be promptly reunited and the measures which should be taken to secure application of this principle have been laid down in a number of international texts. The international standards thus established reflect the best national practices and provide a foundation for action to overcome the difficulties sometimes encountered by emigrants—or would-be emigrants—and their families.

Secondly, there have been many examples of such action in recent years. At both the international and the national levels, new efforts have been made to reunite separated families and provide wider opportunities for family migration.

International Standards

The Migration for Employment Convention and Recommendation (Revised), 1949, adopted by the 32nd Session of the International Labour Conference contain a number of provisions relating to families. One paragraph of the Recommendation is particularly relevant to the subject of this article. It states that provision should be made by agreement to authorise a migrant for employment who has been admitted to an immigration country on a permanent basis to be accompanied or joined by the members of his family [1], and that the movement of the latter should be facilitated by the emigration and immigration countries concerned.

The Convention and Recommendation establish standards for the protection of migrant workers generally throughout the world. However, the I.L.O. considered that some additional protection was required for the underdeveloped or primitive population groups involved in migratory movements in certain parts of Africa, Asia and Latin America. At its 38th Session, therefore, the International Labour Conference adopted the Protection of Migrant Workers (Underdeveloped Countries) Recommendation, 1955. In drafting this Recommendation the Conference took into account the special social and economic factors which affect the possibility of permanent settlement of such migrant workers and their families.[2] The Recommendation states that, except where permanent establishment is clearly against the workers' interest and that of their families or of the economies of the countries or territories concerned, the general policy to be followed should be to seek the stabilisation of the migrant workers and their families in or near the employment centres. It adds that, where lasting settlement of migrant workers at or near their place of employment is found to be possible, arrangements should be made to promote their permanent installation. It specifies that these arrangements should include the encouragement of recruitment of migrant workers accompanied by their families and the provision of housing of an approved standard and at suitable cost.[3]

[1] For the definition of the term " family " given in the text of the Recommendation see footnote 2 on p. 66.

[2] See, in this connection, " Inter-Territorial Migrations of Africans South of the Sahara ", op. cit.

[3] There is also a reference to the migrant's family in the Protocol to the European Convention on Establishment (European Treaty Series No. 19), which was adopted by the

In addition to these formal instruments there are a number of international texts which state the case for family migration and which, because of the widely representative and authoritative character of the organisations which adopted them, have a moral significance comparable to that of international standards. The conclusions of the I.L.O. Preliminary Migration Conference (Geneva, April-May 1950) and the views expressed by the U.N.E.S.C.O. Conference on Cultural Integration of Immigrants (Havana, April 1956) have already been mentioned. The opinion of the Meeting of Experts on Medical Selection of Migrants held in December 1953 under the joint auspices of the International Labour Organisation, the World Health Organisation and the Intergovernmental Committee for European Migration is also of interest.[1] At this meeting, which was attended by thirteen experts drawn from emigration and immigration countries, reference was made to the hardship caused when a member of a family whose breadwinner has already emigrated is refused admission to the immigration country on medical grounds. In order to draw the attention of governments to the need to prevent such hardship and to the manner in which this might be done, the experts stated in their report—

> . . . It is most important, for social reasons, that the family of a migrant should be considered as a unit and that the members of the family should not be separated ; if, however, separation is unavoidable, the migrant should be assured by examination of those members prior to his departure that they are eligible to follow him to his new country.

Finally, there are the General Principles concerning the Protection of Migrants adopted in 1957 by the International Conference of Non-Governmental Organisations Interested in Migration which state, with respect to protection of the family—

> Since the family is the natural and fundamental unit of society, it shall be protected and migrants shall have the right to preserve its unity. The measures necessary to preserve that unity must be guaranteed and must include special provisions to facilitate reunion of the family for all its members. When the head of a family satisfies the necessary conditions for admission to a country, his dependants shall thereby become eligible for admission.

Part of the substance of these principles was reiterated in the resolution adopted by the Conference in June 1959 to which reference has been made earlier.

Action at the National and International Levels

Recent action to facilitate family migration and reunion has been on a scale unheard of in pre-war years. This is hardly surprising since such action has, in many cases, been taken by international and national bodies established since the war for the express purpose of organising

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Council of Europe on 13 December 1955 but which has not yet come into force. The Protocol, which forms an integral part of the Convention, states with respect to the articles of the latter relating to the entry into and residence in the territory of a Contracting Party of a national of another Contracting Party : " The Contracting Parties undertake, in the exercise of their established rights, to pay due regard to family ties." As already mentioned, similar provisions have been included in the draft Regulations of the European Economic Community concerning the free movement of workers between States Members of the Community.

[1] For a note on this meeting see *Industry and Labour*, Vol. XI, No. 4, 15 Feb. 1954, p. 152.

migratory movements and providing assistance to migrants and their families.

The different forms of action evolved can best be described in relation to the difficulties which they have been designed to overcome. It has been shown that, from the point of view of the families concerned, the main difficulties are the following : lack of funds ; shortage of housing ; highly selective immigration criteria based on economic considerations or preferences for certain national or ethnic groups. Some examples of the measures adopted to overcome these difficulties or to mitigate their consequences are given below.

Financial Assistance.

It is in the field of financial assistance that the greatest progress has been made, and numerous families have received loans or grants covering all or part of the cost of their journey to the immigration country.

Sometimes this assistance is provided solely by the authorities of the immigration country, as in the case of the Canadian assisted passage scheme. This scheme, which originally applied only to immigrant workers whose services were urgently required in Canada, was extended in 1955 to cover the dependants of such workers. Under the extended scheme loans covering the cost of ocean transport and transport from the port of arrival to the place of destination may be granted by the Canadian Government to families wishing to migrate as units or to dependants wishing to rejoin their breadwinners in Canada.[1] In France financial assistance is provided in the form of an outright grant. Foreign workers who have been authorised to bring their wives and minor children into the country are required to make only a small fixed contribution to the cost of their journey, the balance being paid by the French Government. Immigrants may also be authorised to bring other relatives to France ; in that case, however, they are required to make a larger contribution towards transport costs.

More often financial assistance is granted jointly by the governments of the emigration and immigration countries concerned, under the terms of bilateral agreements or arrangements. Many such agreements and arrangements have been concluded between European emigration countries and receiving countries in the British Commonwealth and Latin America. Those which the Australian Government has concluded with the governments of some European countries are of particular interest because they stipulate precisely the amounts to be contributed by each of the contracting parties and by the migrant towards the transport costs of adults and children. Some bilateral agreements specify that contributions to transport costs may be made not only by the two governments concerned and by the migrant but also by any international or other organisation prepared to make such contributions.

This latter provision takes into account one of the most important developments of the post-war period so far as financial assistance to migrant families is concerned, namely the establishment of intergovernmental bodies to organise and finance migratory movements. The first of these bodies, the International Refugee Organisation, was set up in order to ensure the permanent settlement of refugees and displaced persons. Between the time of its establishment in 1947 and the cessation of its activities in 1951, it had organised—and, to a large extent, financed—the migration of more than 1 million persons, including many

[1] See *Industry and Labour*, Vol. XV, No. 6, 15 Mar. 1956, p. 245.

family groups. Responsibility for providing international financial assistance to migrants generally, including refugees, was then entrusted to the Intergovernmental Committee for European Migration (I.C.E.M.), which was established at the end of 1951. Between February 1952 and the end of 1959, I.C.E.M. helped many families to migrate as units and enabled many persons (particularly Italians and Spaniards) to join the heads of their families who had emigrated previously (mainly to Argentina, Brazil and Venezuela). These reunions were effected under special " family reunion schemes ", the first of which were organised by I.C.E.M. shortly after its establishment with a view to putting an end to the long separation of numerous families whose breadwinners had emigrated alone during the early post-war years and could still not afford to send for their dependants. The schemes have since continued to be a regular and important feature of I.C.E.M.'s activities.[1]

A number of non-governmental organisations have also helped emigrant families to pay the cost of their journey to the immigration country.

It is unfortunately not possible, owing to the lack of detailed statistics covering all the main emigration and immigration countries, to gauge the full effect of this widespread financial assistance on family migration and reunion during the post-war years. Many governments do issue figures showing the number of workers and dependants respectively in the migration flow to and from their territories. However, these figures do not indicate how many of the dependants travelled as part of a family group and how many followed their breadwinners ; nor do they show how many of the dependants in each of these two categories received assistance in the payment of transport costs.

The scant information available seems, however, to lend weight to the theory that the grant of financial assistance leads to a high rate of family migration. Table I shows that, of the 976,000 migrants transported with the assistance of I.C.E.M. between 1 February 1952 and 31 December 1959, 479,000 (49 per cent.) travelled as part of a family group, while a further 213,000 (nearly 22 per cent.), the majority of whom were dependants, joined the heads of their families in the immigration country. Table II, which shows the number of families reunited by I.C.E.M. under its regular programme, illustrates the effectiveness of the above-mentioned family reunion schemes.

Similarly, figures issued by the Australian Government show that the proportion of family groups in the flow of migrants to that country under assisted passage schemes is substantially higher than that of persons classified as dependants among the total permanent arrivals (see table III). The two sets of figures are, of course, not fully comparable, because the family groups moved under the assisted passage schemes frequently include the breadwinner as well as his dependants while, on the other hand, some dependants joining their breadwinner in Australia are classified as unaccompanied persons. However, even

[1] Under these schemes the following parties contribute to the cost of the movement : the sponsor (i.e. the person wishing to be joined by members of his family) ; the emigration and immigration countries concerned ; males between 18 and 52 years of age who are being moved under the schemes (no contribution is required of women and children) ; and I.C.E.M. The criteria laid down by the countries concerned with respect to the degree of relationship between the sponsor and the persons being moved vary considerably and are sometimes very liberal. In consequence the persons transported have included husbands and wives, children, foster-children, grandchildren, parents, parents-in-law, grandparents, brothers, sisters, nephews, nieces and sometimes even distant relatives.

TABLE I. FAMILY STATUS OF MIGRANTS TRANSPORTED WITH THE ASSISTANCE OF THE INTERGOVERNMENTAL COMMITTEE FOR EUROPEAN MIGRATION, 1952-1959

Year	Unattached persons	Families migrating as units (number of persons)				Family heads migrating in advance of family	Family members migrating as workers for reunion with head of family	Other persons in family migrating for reunion with head of family	Total
		Family heads	Family members migrating as workers	Other persons in family	Total				
1952 [1] . . .	13,380	12,548	3,195	33,413	49,156	759	711	5,815	69,821
1953 . . .	21,817	12,366	1,858	25,621	39,845	3,307	4,326	21,465	90,760
1954 . . .	21,394	12,718	1,663	29,440	43,821	3,442	11,933	42,082	122,672
1955 . . .	26,995	14,477	1,556	34,232	50,265	2,965	8,809	31,408	120,442
1956 . . .	56,600	25,309	2,945	57,720	85,974	6,314	2,728	20,616	172,232
1957 . . .	59,137	30,911	3,732	65,328	99,971	7,370	1,130	28,903	196,511
1958 . . .	25,759	15,383	2,164	34,666	52,213	2,506	699	15,228	96,405
1959 . . .	29,651	16,937	2,369	38,489	57,795	2,587	1,264	15,934	107,231
Total . . .	254,733	140,649	19,482	318,909	479,040	29,250	31,600	181,451	976,074

Source : I.C.E.M. yearly statistical reports. The figures given include movements under the regular programme of the Committee and under special refugee programmes.

[1] 1 February-31 December.

TABLE II. FAMILY MEMBERS MIGRATING FOR REUNION WITH HEAD OF FAMILY UNDER ARRANGEMENTS MADE BY THE INTERGOVERNMENTAL COMMITTEE FOR EUROPEAN MIGRATION, 1952-1959

Year	Number of families																
	Countries of emigration							Countries of immigration									Total
	Austria	Germany	Greece	Italy	Netherlands	Spain [1]	Other	Argentina	Australia	Brazil	Canada	Israel	United States	Uruguay	Venezuela	Other	
1952 [2] . .	191	859	18	824	202	—	149	—	470	438	507	31	437	—	340	20	2,243
1953 . . .	107	1,958	187	5,971	36	—	298	2,465	272	2,374	2,013	55	60	—	1,259	59	8,557
1954 . . .	282	1,647	701	17,525	8	—	659	9,973	1,425	5,323	1,620	24	106	—	2,042	309	20,822
1955 . . .	224	1,016	1,011	14,346	194	—	1,077	6,263	2,566	3,505	1,235	76	318	1,264	2,343	298	17,868
1956 . . .	155	454	449	7,458	147	—	750	2,355	1,756	1,385	980	216	456	481	1,436	348	9,413
1957 . . .	111	267	434	5,358	160	2,611	2,414	2,410	1,276	1,513	2,382	419	266	596	1,803	690	11,355
1958 . . .	87	146	271	3,023	206	2,217	798	1,186	750	1,054	497	461	159	358	1,621	662	6,748
1959 . . .	73	132	219	3,316	157	2,295	595	898	642	1,173	515	276	208	270	2,318	487	6,787
Total. . .	1,230	6,479	3,290	57,821	1,110	7,123	6,740	25,550	9,157	16,765	9,749	1,558	2,010	2,969	13,162	2,873	83,793

Source : I.C.E.M. yearly statistical reports. The figures given relate only to movements under the regular programme of the Committee.

[1] Spain did not become a member of I.C.E.M. until 1956. [2] 1 February-31 December.

allowing for these differences, table III does seem to point to a direct relationship between the grant of financial aid and a particularly high rate of family migration.

TABLE III. PROPORTION OF UNACCOMPANIED PERSONS AND FAMILY GROUPS ARRIVING IN AUSTRALIA UNDER ASSISTED PASSAGE SCHEMES, AND OF WORKERS AND DEPENDANTS AMONG TOTAL PERMANENT ARRIVALS, 1955-59

(Percentages)

Assisted passage schemes [1]	1955-56		1956-57		1957-58		1958-59	
	Unaccompanied persons	Family groups	Unaccompanied persons	Family groups	Unaccompanied persons	Family groups	Unaccompanied persons	Family groups
United Kingdom .	19.5	80.5	16.3	83.7	13.3	86.7	16.96	83.04
Netherlands . . .	6.9	93.1	8.9	91.1	10.3	89.7	11.58	88.42
German (F.R.) . .	22.8	77.2	21.3	78.7	27.7	72.3	41.56	58.44
Austrian	39.3	60.7	48.1	51.9	57.2	42.8	51.89	48.11
Greek	82.9	17.1	77.8	22.2	98.2	0.8	99.52	0.48
Italian :								
Non-nationals .	51.9	48.1	74.7	25.3	48.7	51.3	46.71	53.29
Nationals . . .	59.8	40.2	55.8	44.2	51.5	48.5	51.22	48.78
Maltese	4.9	95.1	14.5	85.5	18.1	81.9	19.88	80.12
Hungarian	—	—	37.2	62.8	35.9	64.1	34.70	65.30
Danish	—	—	—	—	18.8	81.1	—	—
Average . . .	36.0	64.0	39.4	60.6	38.0	61.9	41.56	58.44

Permanent arrivals [2] (assisted and unassisted)	1955-56		1956-57		1957-58		1958-59	
	Workers	Dependants	Workers	Dependants	Workers	Dependants	Workers	Dependants
Average . . .	53.0	47.0	50.7	49.3	45.7	54.3	49.1	50.9

Source : Department of Immigration : *Statistical Bulletin* (Canberra), Nos. 19, 23, 27, 31 and 32.

[1] The percentage of family migration under assisted passage schemes is actually somewhat higher than indicated because childless married women arriving in Australia to join their husbands are classified as " unaccompanied persons ". [2] The term " permanent arrivals " includes all persons arriving with the intention of remaining for 12 months or more.

Housing.

Progress in the field of housing has been on a more modest scale. The provision of housing for immigrant families is a more complex problem than that of financing their transport, because it has both economic and psychological implications. Countries which have a national housing shortage cannot, even if they wish to encourage the immigration of families, grant immigrants more favourable treatment than their own citizens with respect to housing. On the other hand, if they cannot provide suitable accommodation their efforts to promote family immigration may be thwarted. This fact appears to be borne out by a comparison of recent migratory movements to two countries—Australia and France—both of which have a housing shortage and both of which have encouraged the immigration of families by providing generous assistance in the payment of dependants' transport costs.

The rate of family migration to Australia in recent years has been shown in table III. Although, as already pointed out, the high proportion of family groups appears to be directly related to the grant of financial assistance, the Australian Government's ability to provide accommodation for immigrant families has no doubt also been a contributing factor. Arrangements have been made to accommodate both breadwinners and their dependants in government workers' hostels until they can secure permanent housing. It is recognised that this system is only a temporary solution to the problem of housing immigrant families, and by no means an ideal one. It is, however, rightly considered to be infinitely preferable to the only alternative, namely obliging the breadwinner to leave his dependants in the home country until he can find permanent accommodation for them.

In France, on the other hand, as will be seen from table IV, only 0.6 per cent. of the workers admitted as permanent immigrants during the period 1950-59 were accompanied by their families. If the families admitted to join breadwinners already in France are also taken into account, the number of immigrant families (26,311) still represents only 6 per cent. of the number of workers admitted as immigrants during the period (414,224). However, detailed statistics available for part of the period [1] indicate that, on an average, about 45 per cent. of the workers admitted were married men. If this average is assumed to be valid for the period as a whole, the number of married men who entered France as permanent immigrants during that time would be 186,400. If, moreover, the rough estimate previously made—according to which one in three of the foreign workers admitted to France as permanent immigrants returns home [2]—is accepted and assumed to apply to married and single workers alike, the number of married men among the immigrant workers who have remained in France would be 124,266. Even by comparison with this reduced figure, the number of families admitted (26,311) is abnormally low and indicates the stultifying effect of the housing shortage on family immigration to France.

Just as it was recognised earlier that a migrant family should not be expected to bear unaided the cost of a movement beneficial not only to its members but also to the emigration and immigration countries concerned, so it is now being recognised that the financial burden of providing housing for immigrants should not fall solely on the receiving country. In consequence, in the field of housing, as previously in that of transport costs, there is a trend toward international co-operation. The Netherlands Government has recently agreed to advance a substantial sum, in conjunction with Australian banks, to help finance the building of homes for Netherlands migrants in Australia. Similarly, the Council of Europe Resettlement Fund [3] established in 1956 has granted a number of loans to Franco-Italian co-operative societies engaged in the construction of family housing units for Italian immigrants in France. However, the scale of international assistance in the field of housing is as yet extremely small by comparison with the need.

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[1] *Annuaire statistique de la France* (Institut national de la statistique et des études économiques, Paris) (issues relating to years 1955-1958 inclusive).

[2] See I.L.O.: *International Migration, 1945-1957*, Studies and Reports, New Series, No. 54 (Geneva, 1959), p. 351.

[3] For a note on the Council of Europe Resettlement Fund see *Industry and Labour*, Vol. XVI, No. 6, 15 Sep. 1956.

TABLE IV. PERMANENT IMMIGRATION TO FRANCE OF FOREIGN WORKERS AND THEIR FAMILIES, 1950-1959

Year	Number of workers			Number of families admitted to join workers
	Unaccompanied workers	Workers accompanied by their families	Total	
1950	10,057	400	10,457	3,415
1951	20,684	199	20,883	2,160
1952	32,320	349	32,669	2,325
1953	14,943	196	15,139	1,715
1954	11,953	182	12,135	1,400
1955	18,788	136	18,924	1,623
1956	65,180	176	65,356	1,963
1957	111,386	288	111,674	2,698
1958	82,400	408	82,808	3,640
1959	43,908	271	44,179	2,767
Total . . .	411,619	2,605	414,224	23,706

Source : Ministère du Travail et de la Sécurité sociale, Paris : *Travailleurs étrangers en France*, Nos. 15, 20, 24, 28, 31-32 and 33-34 (years 1950-1955 inclusive) ; *Statistiques du travail et de la main-d'œuvre*, Nos. 1 and 13 (years 1956 and 1957) ; and *Statistiques du travail et de la sécurité sociale*, Jan. 1959 and Jan. 1960 (years 1958 and 1959).

Broadening of Immigration Criteria.

There has been no large-scale revision of the immigration criteria which sometimes place obstacles in the way of family migration and reunion. However, a number of post-war measures—some of an exceptional and temporary character—have enabled many families to overcome these obstacles. The measures in question have often been inspired by humanitarian considerations and many of them have been designed to benefit refugees.

The Displaced Persons Act of 1948 made possible the admission to the United States of many refugee families who would have had little or no hope of entering that country under the normal quota procedure because of the relatively small quotas allocated to their countries of origin.[1] Following the expiration of this Act new temporary legislation was adopted in 1953 in the form of the Refugee Relief Act [2] which authorised the granting by the end of 1956 of more than 200,000 immigrant visas outside the normal quota procedure. In spite of its title this Act applied not only to certain categories of refugees and their families but also to prospective Italian, Greek and Dutch emigrants who were parents of United States citizens, spouses or children of aliens who had been admitted to the United States for permanent residence, or brothers, sisters, sons or daughters of United States citizens. It thus made possible the immigration of many family groups and the reunion of many families whose separation would otherwise have been indefinitely prolonged.[3]

[1] See " The Resettlement of Refugees and Displaced Persons in the United States ", in *International Labour Review*, Vol. LXVII, No. 6, June 1953.

[2] See *Industry and Labour*, Vol. X, No. 8, 15 Oct. 1953, " Migration Supplement ", pp. 58-61, and Vol. XIII, No. 3, 1 Feb. 1955, pp. 125-126.

[3] More recent United States legislation has provided further opportunities for the acceptance of refugee families as permanent immigrants outside the normal quota procedure. The Act of 25 July 1958 (Public Law No. 85-559) enabled many Hungarian refugees who had been admitted to the United States on parole since 23 October 1956 to adjust their status to that of permanent residents. The Act of 14 July 1960 (Public Law No. 86-648) makes provision for the admission of certain refugees on parole and the subsequent adjustment of their status to that of permanent residents.

Countries of the British Commonwealth, too, while maintaining their preference for British families, have shown an increasing tendency to open their doors more widely to families of other national origins. This development appears to be a sequel to the events of the early post-war years when the countries concerned accepted, and granted financial aid to, refugees and displaced persons representing many national groups. The assisted passage schemes of the Australian Government, for instance, which were originally devised to help migrants from the United Kingdom, have been progressively extended to cover families from many other countries.[1] However, British families continue to receive a higher degree of financial assistance than other national groups.

Other measures have brought unhoped-for opportunities to many families one or more of whose members had hitherto been debarred from admission to an immigration country on health grounds.

In the United States these measures, like those previously adopted on behalf of refugee families, have taken the form of special legislation. An Act adopted on 11 September 1957 (Public Law No. 85-316) laid down that aliens suffering from tuberculosis (who are debarred from admission under normal legislation) might be granted immigrant visas up to 30 June 1959 if they were the spouses, children or parents of United States citizens or of aliens lawfully resident in the United States. An amendment to this Act subsequently extended the time limit for issue of visas until 30 June 1961 and laid down that they might be granted also to the spouses, children or parents of aliens who had been granted immigration visas. This latter provision is designed to enable the person suffering from tuberculosis to emigrate at the same time as the other members of his family.

A number of countries also waived their normal health requirements in order to permit the admission of Hungarian refugee families following the events of October 1956. In Canada, for instance, about 5 per cent. of the Hungarian refugees admitted were found, on arrival, to require medical treatment.

However, perhaps the most encouraging development of recent years from the point of view of families which include sick or disabled persons has been the acceptance of such persons by a number of countries as part of their national effort in support of the World Refugee Year (June 1959-June 1960).[2] Although some European countries had previously admitted a number of sick refugees and their families, the majority of the non-settled refugees who were unable to meet normal health requirements had failed to secure admission to an immigration country.[3] With the advent of the World Refugee Year, what has been described by the United Nations High Commissioner for Refugees as " a quiet revolution " took place. A number of countries, including Australia,

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[1] Assisted passages may now be granted, in varying circumstances, to persons from the following countries: Austria, Belgium, Denmark, Eire, Finland, France, the Federal Republic of Germany, Italy, Malta, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom and the United States.

[2] For a note on the World Refugee Year see *Industry and Labour* Vol. XXII, No. 11, 1 Dec. 1959, p. 357.

[3] In July 1960 it was estimated that about half of the 17,300 refugees within the mandate of the United Nations High Commissioner for Refugees who were still in camps in Europe belonged to families which included at least one member unable to meet the health requirements laid down by immigration countries. In addition, several thousands of refugees who, although they live outside camps, are not permanently settled, are members of similarly handicapped families.

Belgium, Canada, France, New Zealand, Norway, Sweden, Switzerland and the United Kingdom, announced that they would accept a specified number of refugee families including one or more sick members, or a given number of sick refugees wishing to be reunited with relatives who had emigrated previously. Moreover, this new movement to assist refugees, some of whom had previously been refused admission to an immigration country as many as four or five times, appeared to gain momentum. The Canadian Government, which first admitted 100 refugee families, each including one member with tuberculosis, subsequently stated that these refugees had shown a remarkable ability to integrate rapidly into Canadian society and that it would therefore admit more refugee families, some of which might include more than one member with tuberculosis, as well as some refugees suffering from this disease who wished to join relatives already in Canada. New Zealand, after admitting 20 refugee families with at least one handicapped member, decided to accept 120 more such families and reported that the first 20 had settled down well and were proving to be worth-while citizens. The United Kingdom Government first undertook to admit 150 refugees in family groups each including one handicapped member and subsequently announced a plan for the admission of more handicapped refugees and their dependants. Four hundred and forty persons were accepted under this plan.

Although most of the refugees who were thus given an opportunity of migrating were physically handicapped persons or their dependants, some of those accepted by immigration countries under these special arrangements belonged to families which had previously been unable to secure admission to an immigration country because they were classified as " socially handicapped " (e.g. because they consisted only of a mother and her dependent children) or " economically handicapped " (e.g. because the number of dependants was considered disproportionate to the earning capacity of the breadwinner).

The World Refugee Year has ended, but there are indications that the readiness to facilitate the migration of handicapped persons and their dependants, which it did so much to foster, may continue. A law enacted in the United States on 14 July 1960 (Public Law No. 86-648) provides for the admission of up to 500 refugees classified as " difficult to resettle " (a term often used to describe handicapped refugees and their dependants). In August 1960 the Government of Australia stated that it would admit 500 refugee families, each including one physically handicapped member. In September 1960 it was announced that a further group of physically, socially and economically handicapped refugees and their dependants, totalling more than 550 persons, had been selected for admission to Sweden.

Vocational Training of Breadwinners.

However, one difficulty which prevents the migration of many families—namely, the inability of their breadwinner to meet the occupational requirements of the prospective immigration country—cannot be tackled by action on the lines just described. Immigration countries are not normally prepared to set aside their occupational requirements. Moreover, even were they prepared to do so, emigration would not be in the interest of a family whose breadwinner's qualifications are not high enough to ensure a reasonable standard of living in the immigration country for the family as a whole. The country of origin might indeed oppose the family's departure on these grounds.

It appears, therefore, that the problem must be approached in another way, namely through the provision of vocational training to enable would-be emigrants with family responsibilities to meet the occupational requirements of the prospective immigration country.[1] There is a precedent in this field. In the Netherlands, where government emigration services are highly organised and provide considerable assistance to family groups, there are special agricultural training courses for prospective emigrants. These courses are open to married men and breadwinners, who receive a fixed minimum wage during training as well as free board and lodging.[2]

Conclusion

The new forms of national action and international co-operation developed since the war have helped to smooth the path of international migration for many families. Much has been done in recent years to overcome some of the practical difficulties which impede family migration or reunion, and the further efforts now being made, although sometimes rather limited in scope, hold the promise of new progress.

The barriers created by deep-rooted national attitudes with respect to the admission of certain classes of immigrants are slower to yield. Although in this respect, too, there has been some advance, this has often been made possible only by recourse to exceptional measures of limited scope and duration. In consequence, the migration prospects of many families still depend on factors which bear no relation to the personal worth of their members.

However, one encouraging fact which emerges from the experience of the post-war years is that each step forward has contained the seed of further progress. International assistance to refugees was the forerunner of international assistance to migrants in general. The aid originally granted by some governments only to migrant workers was later extended to cover their dependants. More important still, countries which admitted families or dependants whose integration was expected to prove difficult because of their national origin or their state of health often discovered that their fears in this respect had been unfounded. In fact, what had sometimes been conceived purely as a humanitarian gesture proved to be a sound social and economic investment and led some of the countries concerned to open their doors to other families and dependants in similar circumstances. It is perhaps this particular feature of post-war experience that holds the greatest hope for many families still separated by migration and for those who may in future plan to start a new life in a new land.

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[1] The governments of some emigration and immigration countries have, in fact, recently shown interest in the question of vocational training for migration purposes and there has been some co-operation between the International Labour Organisation, the Intergovernmental Committee for European Migration, the Organisation for European Economic Co-operation and the Council of Europe in regard to this question.

[2] See "The Organisation of Emigration from the Netherlands", in *International Labour Review*, Vol. LXXI, No. 4, Apr. 1955, pp. 413-427.

Part-time Employment for Women in the United States

The Women's Bureau of the United States Department of Labour has issued a bulletin on part-time employment for women [1] *which contains a brief but comprehensive survey of women part-time workers in the American labour force—who they are, why they work part time, where they find part-time jobs—and concludes with a mention of the major factors likely to influence the evolution of such jobs in the future and a few suggestions to women seeking them. In view of the increasing interest in many countries in part-time employment arrangements for women, the following pages contain a summary of the main points brought out in the bulletin.*

Size and Importance of the Female Part-time Labour Force

More women are now working part time [2] than ever before. Throughout 1958 nearly one-third (9,113,000) of the 28,736,000 women who worked during the year were part-time workers. Moreover, the number of women part-time workers increased by 47 per cent. between 1950 and 1958, while women working full time increased by only 15 per cent. Women constituted about three-fifths of all part-time workers in the labour force, whereas they constituted only about a third of the full-time labour force.

Approximately a third (3,000,000) of all women who worked part time in 1958 were year-round workers. About another third were employed on a part-time basis for 3 months or less during the year. Another 1,500,000 women worked part time from 3 to 6 months while the rest worked for more than 6 months but less than a full year (50-52 weeks).

The increase in year-round part-time workers—the largest since 1950—came mainly from the influx of older women into the part-time labour force : women aged 45 years and over accounted for more than half the growth of this group between 1950 and 1958. There has also been a substantial increase in the number of young girls (aged 14-17 years) working part time.

It is estimated that women part-time workers worked the equivalent of some 2,750,000 full man-years and that the hours worked by them accounted for about 15 per cent. of the time worked by all women.

Characteristics of Women Part-time Workers

Typically, a woman part-time worker is married, somewhere between 35 and 44, and working in the service category rather than in manufactur-

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[1] U.S. Department of Labor, Women's Bureau : *Part-time Employment for Women*, Women's Bureau Bulletin 273 (Washington D.C., 1960).

[2] The bulletin defines as part-time workers those working a "shorter than normal" schedule, including anything from 1 to 34 hours per week.

ing or agriculture ; but the notion of the " typical woman part-time worker " conceals many differences within the group of part-time workers as well as many changes which have occurred in recent years.

Age

The number of part-time workers increased in every age group and within each group at a faster rate of growth than for full-time employment. The greatest increase took place among the younger age groups, especially the group 14-17 years old, most of whose members are still attending school. Some 36 per cent. of girls in this group worked during 1958, over three-quarters of them on a part-time basis. After graduating from high school many of these girls become full-time workers.

The tendency for women with young children to leave the full-time labour force and take up part-time jobs is reflected in a large rise in the number of women part-time workers in the 25-34 year group, which increased by a fourth between 1950 and 1958, and that in the 35-44 year group, which increased by more than a third over the same period.

The older age groups showed a very large increase. The number of women part-time workers in the 45-54 year group increased by about one-half from 1950 to 1958. Over a fourth of women workers in this group, more than a third of those in the 55-64 year group and more than half of those over 65 years of age held part-time jobs.

Marital Status

In 1958 single women held about a fourth of all part-time women workers' jobs, married women about three-fifths and widowed, divorced and separated women about 16 per cent. There was little change in the composition of the female part-time labour force between 1950 and 1958, the slight increase in the single women being accounted for largely by the increase in the number of young girls working part time. About one-third of the single women who worked during 1958 did so on a part-time basis as against less than one-fourth in 1950.

Children

In general, available data for 1956 suggest that *(a)* the older the children, the greater the number of weeks a mother tends to work, whether on a full-time or a part-time basis, and *(b)* women with no children under 18 tend to work full time to a greater extent than those with children under this age. In contrast, in 1956 relatively more working mothers with children of school age held part-time jobs than did working mothers of children under 6—a reversal of the 1950 pattern. However, relatively few women with young children worked at all.

Region

The regional distribution of part-time women workers is related to the distribution of industry. It is relatively lowest in the north-eastern states where manufacturing, typically offering few part-time jobs, is heavily concentrated ; and it is relatively highest in the western states, which contain the highest proportion of non-manufacturing employment, typically offering numerous part-time opportunities.

Reasons Why Women Work Part Time

According to data compiled by the Census Bureau in March 1959 the great majority of women who work part time do so for non-economic reasons rather than for economic reasons, the distinction being made from the standpoint of the economy as a whole, not that of the individual worker, so that economic reasons include slack work, material shortages, repairs to plant or equipment and inability to find full-time work, while non-economic reasons include labour disputes, bad weather, illness, vacation, demands of home or school tasks and no desire for full-time work.

About 85 per cent. of those who customarily worked part time did so for personal or non-economic reasons. Almost all the women who usually worked part time for non-economic reasons mentioned the demands of home or school tasks or a lack of desire for full-time work as the cause of their part-time status. Those who usually worked part time for economic reasons were made up mostly of those who could not find full-time jobs.

Most women part-time workers in all the different age groups and in all the different marital status categories were women who customarily worked on a part-time basis for non-economic reasons. However, about a fifth of the widowed, divorced and separated women part-time workers cited economic reasons—a proportion markedly higher than that for other marital status groups.

In most of the occupational groups the women working part time were doing so for non-economic reasons ; that is true, for example, of 70 to 80 per cent. of those in professional, managerial, clerical, sales service and farming occupations. The data reveal, however, that few regular part-time jobs are available for women in the manufacturing sector. Moreover, in 1959 a high proportion of women operatives were underemployed and working part time because there were not enough full-time manufacturing jobs ; about half of the women operatives working part time were doing so for economic reasons and a third of these were usually full-time workers put on reduced hours for lack of full-time work, slack work or other economic reasons.

Industrial and Occupational Distribution of Part-time Jobs

Over 6 million of the 7,250,000 women part-time workers in non-agricultural employment were wage and salary workers, while the self-employed and unpaid family workers amounted to about half a million each.

Most women part-timers in the non-agricultural sector were in one of the many service industries—finance, insurance, real estate, personal services, education, entertainment, medical and social welfare, etc.—industries offering part-time opportunities primarily because of marked fluctuations in business during the day or week or unusually long or short hours of operation. About 2 million of those in service industries were employed as private household workers ; over 200,000 were employed part time in other personal service industries, some 425,000 in educational services (i.e. teaching, administrative, clerical and catering services, etc., in schools and related institutions), some 350,000 in health services, and about 637,000 in other service industries.

Trade industries were the second largest source of part-time employment for women workers and accounted for 1,750,000 of them. Nearly one-third of all female wage and salary earners in the trade industries were working on a part-time basis, mostly in retail trade, in eating and

drinking establishments, department stores, food stores and other retail undertakings.

Taken together, the service and trade industries employed about 5½ million of the 6 million women working on a part-time basis in non-agricultural industries. Of the rest about 425,000 were employed in manufacturing industries and the remainder, in relatively negligible numbers, in administration, public utilities, forestry, fishing and mining.

In manufacturing, women part-time workers were concentrated in the non-durable sectors during 1958, primarily in the apparel, textile and food industries. However, in the first two, part-time employment is an indication of underemployment rather than of regular part-time work opportunities, for the work is seasonal and a policy of work-sharing is applied in slack periods. In fact part-time work for non-economic reasons appears rare in both these industries. Many of the same factors apply in the case of the food industry. Few part-time women workers were employed in the durable goods industries, but printing and publishing employed a substantial number.

A fair amount of women were working part time in public administration—over half of them employed by local authorities and nearly 30 per cent. in the postal service.

In agriculture there were more than 1,750,000 women part-time workers in 1958, but over 1,250,000 of them were unpaid family workers.

From the standpoint of occupational distribution a small number of occupations accounted for a very large portion of all part-time employment of women. Over one-third of all women part-time workers were employed in service occupations, more than one-fourth in clerical or sales occupations, more than one-fifth in farm occupations and most of the rest in professional and semi-technical occupations. In the professional and technical category, the teaching and nursing professions offered a large and increasing number of opportunities for part-time employment. Clerical occupations offered extremely varied possibilities to more than 1½ million women, as did likewise the many service industries.

Part-time Work in the Future

According to labour force projections over the period 1955 to 1975 the annual average number of women working part time is expected to increase by more than 75 per cent., rising to 9 million by 1975. The greatest percentage increase is expected to occur in the 14-24 age group.

These projections are based on expected changes in population and rates of participation in the labour force. But other factors, e.g. changes in school attendance or working-life patterns of girls and women, changes in the pattern of part-time employment opportunity, legal changes and collective agreements, may exert a considerable influence on the evolution of part-time employment. For example longer school attendance might postpone full-time entry into employment and increase part-time work, especially under programmes combining work and study. Married women returning to the labour force after their children have grown might begin to prefer, to a greater extent than in the past, full-time rather than part-time work. Legal changes raising the maximum earnings permissible to retain eligibility for pensions might encourage more retired people to work part time, and tax concessions to working wives might encourage part-time rather than full-time work. Collective agreement provisions will also be important in encouraging or discouraging part-time work.

Finally, the existence of opportunities for part-time work will be an obvious key factor. The growth of industries and occupations able to use part-time workers, shortages of full-time workers, the impact of technological change on part-time as well as full-time jobs—all these and related factors will be important in balancing the increased supply of part-time women workers with the demand for their services.

Suggestions to Women Seeking Part-time Work

For most women part-time workers, as for others, financial reward is an important motive in seeking employment ; and a part-time woman worker has to decide whether a part-time job will meet her money needs, after deducting the increased cost of working (e.g. expenses for transport, meals, clothing, housework or child care) against the wage or salary she will receive. Time schedules are also important considerations for women seeking part-time employment, as well as for their employers. Those suitable for one woman and employer might not suit others, and each woman has to work out in relation to job opportunities the best arrangement possible in her circumstances. She has also to decide which particular type of job to seek, in relation to her qualifications and the demand for part-time workers in the different industries and occupations. In addition, she may have to convince an employer that part-time arrangements are feasible and work out with him the hours and other arrangements which suit his needs.

The bulletin concludes with advice on recruiting methods, pointing out that these vary considerably from one type of work to another, and urging women to make the best use of the available and usual channels of recruitment in their chosen fields of work.

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Documents of the International Labour Conference.

Forty-fifth Session, 1961. Report VI : *Employment Problems and Policies.* Geneva, 1960. 83 pp. 75 cents ; 4s. 6d.

The purpose of this report is to serve as a basis for a general discussion of the question by the International Labour Conference at its 45th Session in 1961. It deals successively with the nature of employment problems, with employment problems and policies in less developed and industrially advanced countries, and with international aspects of the question.

Studies and Reports.

New Series, No. 60. *Labour Survey of North Africa.* Geneva, 1960. xiv+ 473 pp. $4 ; 24s.

Hitherto the activities of the I.L.O. in North Africa have been very largely concentrated on technical assistance, which has been afforded on a considerable scale to requesting governments. It was clear to the Governing Body of the I.L.O., which discussed the matter at its 140th Session (November 1958), that, if the I.L.O.'s programme of activities covering North Africa was to proceed on a broader basis, the first step necessary was the preparation of a comprehensive survey of labour problems in the area, complementary to that covering the countries and territories south of the Sahara.[1] The present volume is intended to fulfil that need.

The region covered by the survey includes all the countries and territories which border the southern coast of the Mediterranean : Morocco, Algeria, Tunisia, Libya and the Southern Province of the United Arab Republic (Egypt).

The first chapter presents, in the broadest possible terms, the essential physical features of the region, its basic economic patterns, and the barest outline of economic and social conditions. In Chapter II a general account is given of the natural conditions in which agriculture, the mainstay of life in the area, is carried on, together with its organisational features, the problems of land tenure, of population pressure, and of living and working conditions of the various categories of workers on the land. Chapters III to XII cover successively the following questions : manpower and employment ; technical and vocational training ; freedom of association and industrial relations ; wages and wage trends ; conditions of work ; social security ; co-operation ; handicrafts ; labour administration and inspection ; and the application of international labour standards. Finally three appendices are provided, containing a reference list of the principal labour legislation, a list of additional tables and a short bibliography.

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[1] I.L.O. : *African Labour Survey*, Studies and Reports, New Series, No. 48 (Geneva, 1958). For an note on this study see *International Labour Review*, No. 1, Vol. LXXIX, Jan. 1959, p. 91.

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Further Problems in Agricultural Policy. Fourth Report on Agricultural Policies in Europe and North America. Report prepared by the Ministerial Committee for Agriculture and Food. Paris, 1960. 352 pp. 18 NF. ; 18 Swiss francs ; $4.50 ; 27s. 6d. ; 15.50 marks.

Organisation for European Economic Co-operation, European Productivity Agency.

Vocational Training in View of Technological Change (E.P.A. Project No. 418). By M. S. D. M. KING. Paris, 1960. 117 pp.

Pan American Union.

População e propriedade da terra no Brasil. By Manuel DIÉGUES. Washington, 1959. 277 pp.

Statistical Office of the European Communities.

Budgets familiaux des ouvriers de la Communauté européenne du charbon et de l'acier, 1956/57. Série statistiques sociales, nº 1. Luxembourg, 1960. 436 pp. 50 Belgian francs ; 5 NF. Exists also in German, Italian and Dutch.

Other Publications *

General.

SIREAU, Albert, ZAÑARTU, Mario, and CERECEDA, Raúl. *Terre d'angoisse et d'espérance, l'Amérique latine.* Préface de Mgr LARRAIN. Paris, Editions universitaires, 1959. 162 pp.

WARD, W. E. F. *Educating Young Nations.* Foreword by H. L. ELVIN. London, George Allen & Unwin, 1959. 194 pp. 15s.

Social and Economic Questions.

AKWAWUAH, K. A. *Prelude to Ghana's Industrialisation.* London, Mitre Press, 1959. 96 pp. 10s. 6d.

With the conclusion of arrangements for the financing of the Volta River Project, Ghana is entering a phase of rapid industrial development. Mr. K. A. Akwawuah, the first President of the West African Management Association, briefly discusses in this book questions of industrial finance, location of industry, planning, unemployment, management and management training and wages in industry, which are of particular interest to his country.

BLOSSEVILLE, J. J., and KNAYER, M. *Productividad. Algunas técnicas para su aumento.* San Salvador, Instituto Salvadoreño de Fomento de la Producción, 1959. 56 pp.

* Mention of a book without a note does not preclude publication of a note in a subsequent issue of the *Review*.

CENTRO JALISCIENSE DE PRODUCTIVIDAD. *El método de simplificación del trabajo.* Guadalajara, 1959. 117 pp.

COLE, Arthur H. *Business Enterprise in Its Social Setting.* Cambridge, Massachusetts, Harvard University Press, 1959. xiii+286 pp. $3.50.

COMMISSION SPÉCIALE, Benelux. *Rapport intérimaire sur l'évolution des salaires au sein du Benelux, 1953-1958.* Brussels, 1960. 87 pp. Processed.

CONFEDERAÇÃO NACIONAL DO COMÉRCIO. *Problemas econômicos e financeiros.* Rio de Janeiro, 1959. 543 pp.

HAIRE, Mason (editor). *Modern Organization Theory. A Symposium of the Foundation for Research on Human Behavior.* New York, John Wiley & Sons ; London, Chapman & Hall, 1959. x+324 pp.

JACCARD, Pierre. *Histoire sociale du travail de l'antiquité à nos jours.* Paris, Payot, 1960. 350 pp.

KNOWLES, Malcolm and Hulda. *Introduction to Group Dynamics.* New York, Association Press, 1959. viii+95 pp. $2.50.

КОСЫГИН, А. Н. *О плане развития народного хозяйства СССР на 1960 год.* Доклад и заключительные слова на 111 сессии Верховного Совета СССР пятого созыва 27 и 30 октября 1959 года. *Закон о государственном плане развития народного хозяйства СССР на 1960 год.* Moscow, Госпланиздат, 1959. 62 pp. 0.60 rouble.

This study by A. N. Kossygin relates to the Plan for the development of the Soviet national economy in 1960 ; it reproduces the report and closing speeches at the 111th Sitting of the Fifth Session of the Supreme Council of the U.S.S.R., and also the text of the State Planning Act, 1960.

КОТОВ, Ф. И. *Вопросы труда в семилетнем плане.* Moscow, Госпланиздат, 1960. 211 pp. 6.60 roubles.

A study by F. I. Kotov of the current seven-year plan, containing some useful information on labour questions in the U.S.S.R. such as productivity of labour, training of cadres, systems of vocational training, questions of wages and hours of work, etc.

KOWALEWSKA, S., KOWALEWSKI, Z., KULPINSKA, J., and SZCZEPANSKI, J. *Elementy psychologii i socjologii pracy, z uwzglednieniem podstaw fizjologii pracy.* Lodz, 1960. 90 pp. (mimeographed).

This study of the psychology and sociology of labour by a leading Polish expert in labour sociology, J. Szczepanski, and three of his associates is intended as an introduction, particularly for managerial staff, to the psychological and social forces at work in industry and to the general question of " human relations ". It is based on the results of research carried out in capitalist countries not only because Polish source material is not available but because, in the words of its authors, " . . . a capitalist enterprise and a socialist one have similar characteristics as organisations of modern work requiring advanced specialisation and co-ordination. The systems of social relations arising out of the processes of work themselves may show far-reaching similarities. The differences between a capitalist and a socialist enterprise concern social relations resulting from the different aims of the enterprise and different principles of the distribution of national income." [1] Consequently the authors do not hesitate to base their considerations on American experiments, and particularly on those which reveal the industrial enterprise as a social system. The work of F. W. Taylor, Chester Barnard, and especially of Elton Mayo is liberally quoted.

[1] In this connection see also the opinions of J. Szczepanski and N. Kabaj quoted in " Current Preoccupations of Social Research in Poland ", in *International Labour Review*, Vol. LXXXII, No. 5, Nov. 1960, pp. 476 and 478.

On the other hand the authors underline the differences between the capitalist and socialist industrial systems. While discussing the " formal " organisation and " informal " bonds in a socialist and in a capitalist enterprise they point to the division between capital and labour in the latter: whereas in a socialist enterprise there is no opposition of management and workers, in a capitalist one there are two " formal " organisations—one of them aimed at attaining goals established by the capitalist, the other representing the interests of the workers. These " formal " structures contain " informal " small groups.

In an introductory historical section the authors pay much attention to the work of Frederick Winslow Taylor and its evaluation in Marxist thought. The next parts deal with characteristic features of human nature, the impact of social life upon individuals, the differentiation of men from the viewpoint of physiology, psychology and sociology, and physiological adjustment to work.

Under the heading " The Worker and the Machine " the interesting question of the relationship of workers to technical progress is discussed among others. This is followed by an analysis of the problems of selection and adjustment to work, which deals with job analysis and evaluation, methods of selection and classification of workers, and contemporary views on the vocational training ; it is underlined here that training for industrial occupations should give the worker not only technical skill but also social and humanistic knowledge ; that it should aim not only at raising productivity of the worker but also at developing his whole personality. In an attempt to answer the question " Why does man work ? " the authors discuss the most frequent motivations of work, the ways of attaining satisfaction from work, the " morale " of the worker and the factors it depends upon, and the types of stimulants used to encourage the workers to achieve the goals of the enterprise. Further sections are devoted to the role of personal and environmental factors in the individual's performance of work, to the problems of selection and preparation for professions and trades, and to the advancement of employees.

Sections 9 to 11 deal with the enterprise as a social system and with social factors influencing performance of work. Industrial enterprise, write the authors, is a micro-society comprising a " formal " organisation and " informal " spontaneous small groups. The attitudes of small groups exercise a decisive influence upon the productivity and efficiency of the enterprise : " It depends upon management whether . . . informal groups are utilised for positive purposes or become factors of disorganisation." In the following two sections the authors also discuss the problem of industrial bureaucracy, its necessity in a big modern enterprise, its growth and deformations. Much attention is paid to industrial management as seen from the psycho-social angle ; management is considered not as a " formal " structure but as a means of gaining the confidence of workers, handling small groups, and raising productivity. The workers' share in management (both in capitalist and socialist countries) is also discussed.

Section 14 is devoted to different forms of disorganisation in industry, such as absenteeism, labour turnover, low productivity, accidents, conflicts and strikes. These may stem from the failure of management, errors in the " formal " organisation of industry, the lack of compact " informal " groups among workers exercising a favourable influence, and the effect of outside groups and environmental pressures conflicting with the goals of the enterprise. Conflicts between groups in socialised industry are next discussed. These may be caused by either rational or irrational motives and may oppose management and workers, white-collar workers and blue-collar workers, old and young workers, skilled and unskilled workers.

The last chapter is devoted to lesiure and its importance for labour.

LANGE, Oskar. *Ekonomia Polityczna.* Tom I. Zagadnienia ogólne. Warsaw, Państwowe wydawnictwo naukowe, 1959. 302 pp. 25 zlotys.

This is the first of a three-volume outline of economics. In it Professor Lange deals with general problems. After a brief outline of such basic

economic concepts as production and services, consumption and distribution, attention is given to the interdependence of productive processes and social institution and to the dialectics of social development. Professor Lange expresses the view that an important part can be played by economics, particularly under conditions of socialism, in the solution of practical problems and in the promotion of social development, provided that economic research is carried out in a truly scientific spirit regardless of prejudices and forces that may try to bar the road to social progress.

MINISTRY OF LABOUR AND EMPLOYMENT, India. *Productivity Project in Building Industry.* Bombay, 1959. ii+130 pp.

НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ КОНЪЮНКТУРНЫЙ ИНСТИТУТ МВТ СССР. *Экономическое положение стран Азии, Африки и Латинской Америки.* Moscow, Внешторгиздат, 1959. 445 pp. 15.50 roubles.

The economic situation of the Asian, African and Latin American countries. Issued by the Conjunctural Research Institute of the Ministry of Foreign Trade of the U.S.S.R.

SLOTKIN, James Sydney. *From Field to Factory. New Industrial Employees.* Glencoe, Illinois, The Free Press, Research Center in Economic Development and Cultural Change, The University of Chicago, 1960. 156 pp.

СМИРНОВ, А. А. *Экономика, организация производства и планирование в угольной промышленности.* Moscow, Госгортехиздат, 1959. 335 pp. 6.90 roubles.

Economy, organisation of production and planning in the coal industry, by A. A. Smirnov.

SOSIALDEPARTEMENTET, Norway. *Sosiale fakta.* Oslo, 1960. 167 pp.

A handbook published by the Norwegian Ministry of Social Affairs giving a brief description of the various social security schemes, social welfare and assistance schemes, labour legislation and labour conditions, housing, etc. The publication may be obtained in a loose-leaf edition which will be kept up to date by the issue of new pages as changes are made.

SPINELLI, Armando Pedro. *Ensayos de política económica argentina.* La Plata, Universidad Nacional, Facultad de Ciencias Económicas, 1960. 278 pp.

SUDOPLATOV, A. *Coal Industry of the U.S.S.R.* Moscow, Foreign Languages Publishing House, 1959. 155 pp. 4 roubles.

This booklet contains brief fundamental data on the development of the coal industry of the Soviet Union, and provides general information on the country's coalfields, coal-mining equipment and techniques, as well as on the research carried on in this field and the structure of management. Readers interested in social problems in this industry will also find information on such questions as the improvement of the organisation of work and labour, increasing labour efficiency, health and safety, and changes in the working and living conditions of coal miners.

UNION INTERNATIONALE DES ORGANISMES FAMILIAUX. *Points de vue sur les problèmes de population.* Paris, 1960. 35 pp.

ЗАГОРУЛЬКИН, В., МЕНЬКО, П., and ПЕРЕПЕЛКИН, Д. *Постоянно действующие производственные совещания.* Библиотечка профсоюзного активиста. Moscow, Профиздат, 1960. 127 pp. 1 rouble.

The " permanent production conference " in Soviet undertakings, by V. Zagorulkin, P. Menko and D. Perepelkin.

Statistics.

DEPARTMENT OF COMMERCE, Bureau of the Census, United States. *The Soviet Statistical System : Labor Force Recordkeeping and Reporting.* By Murray FESHBACH. International Population Statistics Reports, Series P-90, No. 12. Washington, 1960. 151 pp. 45 cents.

This is a comprehensive study of the structure and operations of Soviet statistical agencies concerned with collecting labour force data. It throws light on the data collected, how they are checked, channelled through the various local planning boards and finally made available for the central planning authorities. The book gives an interpretation of some important employment statistics published in recent Soviet statistical handbooks.

The labour force reporting practices described are those in use about 1956 and before the administrative reorganisation of mid-1957.

DEPARTMENT OF LABOR, Bureau of Labor Statistics, United States. *Science and Engineering in American Industry.* Report on a 1956 survey, prepared for the National Science Foundation. Washington, 1959. ix+117 pp. 70 cents.

DIRECTORATE OF ECONOMICS AND STATISTICS, Madhya Pradesh. *Regional Income Atlas of Madhya Pradesh.* Bhopal, 1960. 115 pp. 5 rupees.

Presents in the form of charts and text, the distinctive economic characteristics of each region of the state of Madhya Pradesh : total and per capita income ; size and composition of the working force ; agriculture, animal husbandry, hunting, fishery and forestry ; mining and industry.

GROSSMAN, Gregory. *Soviet Statistics of Physical Output of Industrial Commodities. Their Compilation and Quality.* A study by the National Bureau of Economic Research. Princeton, New Jersey, Princeton University Press, 1960. 151 pp. $4.50.

Social Welfare Statistics of the Northern Countries, 1956 (1956-57). Nordisk Statistisk Skriftserie. Statistical Reports of the Northern Countries. Translation of Statistical Reports of the Northern Countries, No. 6. Oslo, Fellestrykk A.S., 1960. 114 pp.

In order to co-ordinate their social welfare statistics the Nordic Countries (Denmark, Finland, Iceland, Norway and Sweden) set up a committee of statistical experts in 1945. Beginning in 1949 this committee has issued every two years a report giving detailed statistics on the various aspects of social security and social welfare schemes in the five countries. In addition to describing the methodology followed, the present report gives data of expenditure on the various measures of social security and social welfare. One section of the report is devoted to a comparative analysis of the scope, level of protection, etc., of each type of benefit or scheme, e.g. sickness, employment injuries, unemployment, pensions, family allowances, rehabilitation, the various kinds of social welfare and social assistance, etc.

STATISTISCHES BUNDESAMT, Federal Republic of Germany. *Internationale Standardklassifikation der Berufe.* Deutsche Übersetzung der *International Standard Classification of Occupations* des Internationalen Arbeitsamtes, Genf, 1958. Stuttgart and Mainz, W. Kohlhammer GmbH, 1960. 295 pp. 15 marks.

This is a German-language version, issued by the Federal Statistical Office of the Federal Republic of Germany, of the *International Standard Classification of Occupations* [1] adopted by the Ninth International Conference of Labour Statisticians in 1957.

[1] Geneva, I.L.O., 1958.

Центральное статистическое управление при Совете Министров СССР. *Здравоохранение в СССР*. Статистический сборник. Moscow, Госстатиздат, 1960. 272 pp. 6.65 roubles.

Public health in the U.S.S.R. A collection of statistical data issued by the Central Statistical Directorate of the Council of Ministers.

Industrial Relations ; Employers' and Workers' Organisations.

Atteslander, Peter. *Konflikt und Kooperation im Industriebetrieb*. Probleme der betrieblichen Sozialforschung in internationaler Sicht. Cologne, Oppladen, Westdeutscher Verlag, 1959. 341 pp.

Dubois, Alexandre. *Confidences d'un patron sur la réforme de l'entreprise*. Paris, Les Editions ouvrières, Economie et humanisme, 1960. 140 pp. 5.10 NF.

Pelling, Henry. *American Labor*. Chicago, University of Chicago Press, 1960. vi+247 pp.

Union des industries métallurgiques et minières, France. *Les relations professionnelles dans la sidérurgie américaine et le conflit de 1959*. Etudes étrangères : Etats-Unis. Paris, 1960. 135 pp.

A very full study made by the Association of the French Metallurgical and Mining Employers on the 1959 steel conflict in the United States. It contains a general survey of the evolution of industrial relations since the 1952 conflict (a study on which was published by the same association : *Le conflit de la sidérurgie aux Etats-Unis*, by Pierre Waline). This is followed by an introduction to the parties on the workers' and employers' sides, including the structure, the organisations and the main personalities involved. After a detailed description of the economic and social background of the conflict, and its development and resolution, one final chapter analyses the reasons for the different attitudes taken by employers, workers and the Government during the conflict. Letters, declarations and reports relevant to the conflict are given in appendices.

Labour Law.

Александров, Н. Г. *Советское трудовое право*. Второе издание. Moscow, Госюриздат, 1959. 407 pp. 9.25 roubles.

Soviet labour law, by N. G. Alexandrov.

Istituto di Studi sul Lavoro. *Coordinamento degli studi sul lavoro*. Atti del sesto convegno nazionale. Milan, Istituto di Studi sul Lavoro, 1959. 97 pp.

Noack, I., and Zecher, R. *Rechte und Pflichten der Jugendlichen im Arbeitsprozess*. Berlin, VEB Deutscher Zentralverlag, 1959. 334 pp. 4.80 marks.

A compendium of the legal rights and duties of young workers in the Democratic Republic of Germany, compiled for the information of young persons and their employers.

State of Singapore. *Report of the Commission of Inquiry into the System of Contract Labour in Singapore*. Singapore, 1960. xii+128 pp. $3.

The inquiry covered contract workers in the following fields : waterfront occupations ; building industry ; rubber industry ; saw-milling ; quarrying ; gold and silversmiths ; and tailoring.

The Commission recommends that in order to obviate the present practice of shifting responsibility between the principal and the contractor, all contractors should be registered with the Ministry of Labour. Once registered, a contractor would be deemed to be the direct employer of his labour force and would be held responsible for complying with the provisions of the

Labour Ordinance and related regulations, an obligation to which the registering authority would be required to draw the attention of all contractors at the time of registration. The Commission recommends further that a penalty clause should be introduced for breach of any of the conditions laid down for registration or for failure to register. The registering authority would then have the power to cancel the registration of any contractor for repeated offences. In cases where principals employ contractors and their labour force consistently for relatively long periods of time the Commission recommends that the Commissioner for Labour should be empowered to investigate the situation and report to the Minister, who would decide whether or not the labour force in question should be directly employed by the principal. The report concludes with recommendations for the establishment of a central provident fund and the issue of wage books.

STESSIN, Lawrence. *Employee Discipline.* Washington, Bureau of National Affairs, 1960. ix+315 pp. $7.85.

Management.

CHRUDEN, Herbert J., and SHERMAN, Arthur W. *Personnel Management.* Cincinnati, South-Western Publishing Company, 1959. xii+670 pp.

COPEMAN, George. *The Role of the Managing Director.* London, Business Publications Ltd., in association with B. T. Batsford Ltd., 1959. xxx+284 pp. 42s.

FAYERWEATHER, John. *Management of International Operations. Text and Cases.* New York, Toronto, London, McGraw-Hill Book Company, 1960. xiv+604 pp. $9.50.

FENN, Dan H. (editor). *Management's Mission in a New Society.* New York, Toronto, London, McGraw-Hill Book Company, 1959. xii+345 pp.

Лясников, И. А. *Планирование труда в народном хозяйстве СССР.* В помощь экономисту и плановнику. Moscow, Госпланиздат, 1959. 73 pp. 1.10 roubles.

Labour planning in the national economy of the U.S.S.R., by I. A. Liasnikov.

NOLTINGK, B. E. *The Human Element in Research Management.* Amsterdam, London, New York, Princeton, Elsevier Publishing Company, 1959. vi+91 pp.

Manpower.

CENTRE DE RECHERCHES SOCIO-RELIGIEUSES. *América latina. Evolution de l'emploi et stratification sociale en Amérique latine.* Brussels, Centre de recherches socio-religieuses, 1960. 266 pp.+36 annexes. Processed.

NORTHERN IRELAND HOSPITALS AUTHORITY. *Report of Nursing Committee.* Belfast, 1959. ix+173 pp. 7s. 6d.

OFFICE BELGE POUR L'ACCROISSEMENT DE LA PRODUCTIVITÉ. *Chômage existant.—Bestaande werkloosheid.* Brussels, 1959. 16 pp.

STAMMER, Otto. *Angestellte und Arbeiter in der Betriebspyramide.* Eine empirisch-soziologische Studie über die Verteilung der Arbeitsplätze von Angestellten und Arbeitern, ihre Personaldaten und Arbeitsverdienste in Betrieben der gewerblichen Wirtschaft. Von Dieter CLAESSENS, Jochen FUHRMANN, Günther HARTFIEL, Hans ZIRWAS. Berlin, Westliche Berliner Verlagsgesellschaft Heenemann, 1959. 166 pp.

WOLTER, Robert, DAVREUX, Léon, and REGNIER, René. *Le chômage au Congo belge. Rapport d'enquête, 1957.* Centre scientifique et médical de l'Université libre de Bruxelles en Afrique centrale, XXXI. Brussels, Institut de sociologie Solvay, 1959. 110 pp.

Vocational Guidance and Training.

АКАДЕМИЯ НАУК СССР. *Научные кадры в СССР.* Сборник документов и справочных материалов. Под редакцией академика А. В. Топчиева. Moscow, Издательство Академии наук СССР, 1959. 304 pp. 8 roubles.

Scientific cadres in the U.S.S.R. A collection of documents and reference material, edited by A. V. Topchiev and published by the Academy of Sciences of the U.S.S.R.

КОМАРОВ, В. Е. *Экономические основы подготовки специалистов для народного хозяйства.* Moscow, Издательство Академии наук СССР, 1959. 206 pp. 7.70 roubles.

The economic principles of the training of specialists for the national economy, by V. E. Komarov.

SCHMIDT, Rudolf. *Die Rehabilitation und ihre praktische Durchführung.* Schriftenreihe der Bundesversicherungsanstalt für Angestellte, No. 13. Berlin, 1959. 23 pp.

SOCIETÀ UMANITARIA. *Dalla scuola di avviamento alla scuola media di orientamento.* Esperienze per una riforma. Florence, La Nuova Italia, 1959. 200 pp. 3,000 liras.

Social Security.

AMERICAN MANAGEMENT ASSOCIATION. *Risk Management Today. Problems, Trends, and Practices.* A.M.A., Management Report No. 47. New York, 1960. 100 pp. $3.

A compilation of articles, primarily for company executives in charge of insurance, on the various methods currently used by employers to meet the health, employment injury and other insurance needs of their employees.

BALLING, Heinz. *Das geltende Beitragsrecht für die Sozialpflichtversicherung der Arbeiter und Angestellten, Studenten sowie der Mitglieder sozialistischer Genossenschaften,* Heft 6. Berlin, VEB Zentralverlag, 1959. 216 pp.

CLARK, Robert M. *Economic Security for the Aged in the United States and Canada.* A report prepared for the Government of Canada. Two volumes. Ottawa, the Queen's Printer and Controller of Stationery, 1960. Vol. I : xxiii+344 pp. ; Vol. II : xiii+350 pp. $6.

This two-volume work represents a report to the Canadian Minister of National Health and Welfare undertaken pursuant to an Order in Council commanding an inquiry to be conducted " into the facts relating to old-age security systems in effect in Canada and the United States with particular reference to those features of the old-age and survivors' insurance programme in the United States which make it possible for higher benefits to be paid covering a wide range of contingencies at an earlier age than is provided under present legislation . . . ".

Volume I contains a detailed description of the origin and scope of the United States programme and its benefit, administrative, tax and financing provisions. The United States old-age assistance scheme as well as the Canadian old-age security programme and supplementary assistance schemes are also described in this volume, though in less detail.

The second volume describes Canadian government amenities, and compares selected features of United States and Canadian old-age security legislation and of private pension schemes in both countries. Special chapters

are devoted to a discussion of principles applied in determining a basic government pension and adjusting it for changes in the price level, and to the possibility of instituting in Canada a contributory pension programme with graduated benefits. Several technical annexes, a comprehensive bibliography as well as a persons' and a subject index conclude the second volume.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, Social Security Administration, United States. *Basic Readings in Social Security. 25th Anniversary of the Social Security Act, 1935-1960.* Washington, 1960. vi+221 pp. $1.

This latest revised edition of a bibliography first published in 1936 reveals the growth of the literature on the subject, in that the original ten mimeographed pages with 46 entries have grown to a full-length book with 1,640 items.

DEPARTMENT OF LABOR, Women's Bureau, United States. *Maternity Benefit Provisions for Employed Women.* Women's Bureau Bulletin 272. Washington, 1960. v+50 pp. 25 cents.

A brief description of voluntary, union-management, and statutory plans existing in the United States to provide for health, maternity, and related benefits, and of other protective measures for women in private or public employment, as well as of existing public health services for women in general.

DEPARTMENT OF LABOR, State of New York. *Health Benefit Coverage on the Labor Force in New York State, December 1958.* Publication No. B-114. New York, 1960. 84+27 pp. (supplementary tables).

Statistical data on coverage under medical care and hospital insurance plans of all kinds, and a detailed analysis of employer-financed benefit plans based on a state-wide sample survey.

HALL, Theo Peter. *Gemeinsame betriebliche Sozialpolitik kleinerer und mittlerer Unternehmen.* Cologne, Verlag Otto Schmidt, 1959. 90 pp. 7.80 marks.

HARBRECHT, Paul P. *Pension Funds and Economic Power.* New York, The Twentieth Century Fund, 1959. 328 pp. $5.

An economic and legal analysis of the development and present characteristics of private pension trusts in the United States. The author describes the rapid spread of this institution, the impressive growth of its financial scope, and its implications for the national economy. He projects the pension trusts' future growth and attempts to anticipate the direction and extent to which this relatively new institution may, in the long run, affect not only the capital market but the very nature of private property in capitalist society and, concomitantly, may transform that society itself. Policy recommendations are made to close existing gaps in control of pension trusts in the interest of their eventual beneficiaries and to remedy other weaknesses which the author finds to exist in their present mode of operation.

HELBLING, Carl. *Autonome Pensionskasse oder Gruppenversicherung.* Veröffentlichungen des Versicherungswirtschaftlichen Seminars an der Handels-Hochschule St. Gallen. Zürich, St. Gallen, Polygraphischer Verlag, 1960. xiv+197 pp. 22 francs.

HOSKING, Gordon A. *Pension Schemes and Retirement Benefits.* 2nd edition. London, Sweet & Maxwell Ltd., 1960. xv+466 pp. 50s.

A comprehensive treatment of the various possible approaches to, and facets of, pension schemes in private industry, including underwriting techniques, taxation and other legal aspects, and their place relative to the British national insurance scheme, notably the new programme of graduated pensions which permits " contracting out ". The book contains also a cursory review of the United States pension scene.

MEJÍA, Abel. *Trabajos de medicina social venezolana (25 años de labor).* Caracas, Dirección de Cultura de la Universidad Central de Venezuela, 1960. 513 pp.

MORALES BENÍTEZ, Otto. *Seguridad social integral.* Biblioteca del Ministerio del Trabajo. Bogotá, Ministerio del Trabajo, 1960. 88 pp. Bibliography.

PILCH, Michael, and WOOD, Victor. *Pension Schemes.* Foreword by Lord BEVERIDGE. London, Hutchinson & Co., 1960. 223 pp. 40s.

This book, intended primarily for pension planners in private business, is a practical guide to private pension schemes and their relationships with the British national pension scheme. An attempt is made to combine a discussion of principles with specific information on organisation, financing and tax aspects—all these against the background of existing national legislation and programmes. The conclusions set forth the authors' position on what they consider a desirable course for future public policy with regard to national pensions.

RICHARDSON, J. Henry. *Economic and Financial Aspects of Social Security. An International Study.* London, George Allen & Unwin, 1960. 270 pp. 30s.

A comprehensive treatment of the subject-matter, covering the "philosophy" of social security programmes and various theoretical considerations and principles governing their design, as well as a topical discussion of their institutional, economic and financial aspects. In addition to social insurance programmes to cope with the economic effects of sickness and of other common contingencies, the book discusses also family allowance programmes. A final chapter is devoted to various broader aspects and policy questions such as the role of social security programmes in underdeveloped countries, their impact on the national economy, and certain international questions.

ROMM, Elliot. *Pension Planning : A Data Book.* A.M.A. Research Study 43. New York, American Management Association, 1960. 79 pp. $3.

Presents, for the use of retirement pension planners in private industry, the major features of 127 company retirement plans covering more than 1.5 million employees.

ROUAST, André, and DURAND, Paul. *Sécurité sociale.* Deuxième édition. Précis Dalloz. Paris, Dalloz, 1960. 626 pp.

Living Conditions ; Workers' Education.

COMMISSION DE COOPÉRATION TECHNIQUE EN AFRIQUE AU SUD DU SAHARA, Conseil scientifique pour l'Afrique au sud du Sahara. *Conférence interafricaine sur le logement et l'urbanisation (deuxième session), Nairobi, 19-30 janvier 1959.* Publication nº 47. London, 1959. 294 pp.

FISHER, Robert Moore. *Twenty Years of Public Housing.* Economic Aspects of the Federal Program. New York, Harper & Brothers, 1959. xiii+ 303 pp. $6.50.

The author traces the evolution of the public housing programme in the United States and makes a comprehensive analysis of its economic aspects. He first defines public housing, indicates how the low-rent programme was justified, presents some results to date and identifies the friends and the enemies of public housing. Next he turns to the subjects of housing standards and costs. A number of new findings are given concerning the persons who inhabit substandard housing in metropolitan areas and the types of accommodation they occupy. The relation between substandard housing and social disorders is referred to, and an assessment is made of the monetary costs and benefits of public housing to the federal and local governments. Finally, the author reviews the extent to which the three main objectives of the United States Housing Act of 1937—the charter of

the present federal public housing programme—have been met, namely elimination of substandard housing ; provision of adequate dwellings for low-income families ; and the reduction of unemployment.

HAAR, Charles M. *Federal Credit and Private Housing. The Mass Financing Dilemma.* New York, Toronto, London, The McGraw-Hill Book Company, 1960. xxxiii+408 pp. $12.50.

After surveying the organisation and achievements of the housing credit agencies of the United States Federal Government, Professor Haar discusses the primary and secondary mortgage markets which have made possible the mass financing revolution in the United States. He maintains that the many-sided governmental housing programme, beginning in 1934, has been " whirled into being with little appraisal or examination ". The volume also contains several interesting appendices on the Federal Home Loan Bank system in its relationship to the Federal Reserve Bank system ; the mortgage insurance system ; home ownership insurance and guarantee programmes ; rental insurance programmes ; and direct lending by the Veterans Administration.

L'Habitation. Comment réussir les grands ensembles. Compte rendu *in extenso* du colloque organisé les 21, 22 et 23 janvier 1960 au Palais de l'U.N.E.S.C.O. Numéro hors série, 80 *bis*, avril 1960, Paris, *L'Habitation* (revue mensuelle), 1960. 232 pp. 2.20 NF.

A symposium of views from a wide range of well-qualified persons, mainly French, associated in one way or another with house-building activities, showing that some of the most difficult problems associated with living in high apartments have not yet been solved. Many of the positions taken in this symposium have their exponents elsewhere, but certain observations, particularly some of those based on analyses of recent French experience, shed new light on the subject.

КОЗЛОВА, О. В. *Подъем культурно-технического уровня рабочего класса СССР.* Moscow, Госполитиздат, 1959. 219 pp. 3 roubles.

Raising the cultural and technical level of the working class in the U.S.S.R., by O. V. Kozlova.

Liaisons sociales. La promotion sociale. Réalisations, opinions, tous les textes. Essai de définition. Supplément 55/60, jeudi 19 mai 1960. Paris, 1960. 120 pp. 6 NF.

LIVERIGHT, A. A. *Capacitación de líderes sindicales.* Manual de métodos y técnicas. Mexico City, Editorial Intercontinental S.A., 1959. xvi+ 267 pp.

MARTINI, Gianfranco. *L'impiego del tempo libero.* Rome, Edizioni Pauline, 1959. 212 pp.

MINISTRY OF HOUSING, Copenhagen ; STATE HOUSING BOARD, Helsinki ; HOUSING DIRECTORATE, Oslo ; NATIONAL HOUSING BOARD, Stockholm. *Housing in the Northern Countries.* Copenhagen, 1960. 148 pp. Exists also in French.

A concise reference book on the main features of Scandinavian housing policy. The following subjects are covered in separate discussions of the four countries : society and housing ; structure of the building market ; housing production and housing demand ; housing standards ; building legislation, town planning, etc. ; and rationalisation, research and educational activity.

ПОСТОВОЙТОВ, В. К. *О культуре молодого рабочего.* Moscow, Профтехиздат, 1960. 110 pp. 1.70 roubles.

Culture and the young worker, by V. K. Postovoitov.

PRIETO F., Luis B. *La colaboración privada con la educación popular americana.* Caracas, Universidad Central de Venezuela, 1959. 236 pp.

This is probably the first comprehensive monograph in Spanish on the contribution of private enterprise to mass education. It results from a broad survey made in all the American countries. Although methods of financing education and literacy projects and the role which can be played by private individuals and institutions in this regard are the author's main theme, he also examines the problems of children's primary instruction, the general and technical training of adults, and workers' education. Suggestions for the solution of these problems are made. The author also stresses the need for co-ordinating all efforts in the education field, at the national and international levels, by means of a regulating organisation. The book closes by reproducing the text of several official documents on this subject.

WOOD, Robert C. *Suburbia, Its People and Their Politics.* Boston, Houghton Mifflin Company, 1959. xi+340 pp. $4.

Agriculture.

AGRARSOZIALE GESELLSCHAFT eV GÖTTINGEN. *Bäuerliche Wirtschaftsführung im Kraftfeld der sozialen Umwelt.* Eine soziologische Analyse von Peter von BLANCKENBURG. Schriftenreihe für ländliche Sozialfragen, Veröffentlichungen der Agrarsozialen Gesellschaft eV Göttingen, Heft 26. Hanover, Verlag M. & H. Schaper, 1960. 196 pp. 15.60 marks.

This study is concerned with analysing the relationship between economic and social factors in family farming. The main questions investigated are how far the economic actions of farmers are influenced by their social environment and on what factors this influence depends.

The first chapter introduces the problems involved and the methods used in the investigation. The following three chapters analyse the material obtained through field surveys in nine villages in two Länder (North-Rhine-Westphalia and Lower Saxony) in the Federal Republic of Germany. The surveys concentrated on examining the influence of the village and its various groups, of family relations, and of individual status on the social behaviour of family farmers, particularly the management of their holdings.

The last chapter contains a critical review, based on the findings of the study, of the theory of economic behaviour.

There is a summary in English of the major findings of the study.

АКАДЕМИЯ НАУК СССР, ИНСТИТУТ КИТАЕВЕДЕНИЯ. *Социалистическое преобразование сельского хозяйства в Китайской Народной Республике (1949-1957).* Moscow. Издательство восточной литературы, 1960. 207 pp. 7 roubles.

The socialisation of agriculture in the Chinese People's Republic (1949-57). Issued by the Institute for Chinese Research of the Academy of Sciences of the U.S.S.R.

MINISTERIO DE AGRICULTURA, Colombia. *Documentación sobre explotaciones agrícolas, tenencia de la tierra, colonización y reforma agraria en Colombia.* Bogotá, 1959. 69 pp.

SCHLOTTER, Hans-Günther. *Die Förderung der westdeutschen Landwirtschaft durch öffentliche Mittel 1949-1956.* Hanover, Verlag M. & H. Schaper, 1960. 121 pp.

WILCOX, Walter, and COCHRANE, Willard W. *Economics of American Agriculture.* Second edition. Englewood Cliffs, N.J., Prentice-Hall, 1960. vi+538 pp.

YATES, P. Lamartine. *Food, Land and Manpower in Western Europe.* London, Macmillan & Co.; New York, St. Martin's Press, 1960. xiii+294 pp. 35s.

This analysis of agriculture in Western Europe in relation to the food requirements of its population is the first of a series of investigations spon-

sored by the Twentieth Century Fund into the economic needs and resources of Western Europe.

The first part of the study attempts to put the problems in their proper perspective. In the second part a detailed review is made of differences in national diets, levels of nutrition and trends in consumption. The third part examines the main features and problems of agriculture and the position of farming in the national economies of various European countries, emphasis being laid on such questions as labour and food supply, land and food supply, use of land as a resource, and labour productivity.

This is followed by an appraisal of national situations and trends in agricultural structure and production patterns in relation to technological progress. Particularly dealt with are those fields and aspects of farm modernisation which are of major significance and in which there is still much room for improvement : farm sizes, consolidation, land settlement, land tenure, productivity, commercialisation, research and extension, etc.

The fifth part of the book discusses problems connected with food imports and exports and their importance in the various Western European countries.

Differences in government policies towards agriculture, particularly the extent of support given to this sector and the basic principles underlying such support, form the subject of the last part, which also contains a critical review of these policies as well as a number of proposals for a constructive programme for agriculture. This programme should, in the author's view, be concerned with three major objectives : recasting the price structure to provide more rewards to enterprise ; assisting redundant agricultural manpower to find permanent employment in other sectors ; and increasing the technical knowledge of those remaining in agriculture.

Co-operation ; Handicrafts.

Булатов, И. Г. *Кооперация и ее роль в подготовке сплошной коллективизации*. Moscow, Соцэкгиз, 1960. 200 pp. 4.10 roubles.

Co-operative organisation and its role in preparing for total collectivisation, by I. G. Bulatov.

Digby, Margaret. *The World Co-operative Movement*. London, Hutchinson University Library, 1960. 192 pp. 12s. 6d.

This is the second edition, revised and brought up to date, of a book written to serve the general reader as an introduction to co-operation. The author begins by giving a brief survey of the growth of the idea of co-operation and how it gradually spread to different countries. The consumer movement is then described, followed by studies on workers' production co-operatives, co-operative credit to farmers, co-operative credit to workers and co-operative insurance. The supply of farm requirements and the marketing of agricultural products are then dealt with and collective farming in different countries and of various forms is examined with special reference to the latest developments and experience in this field of co-operative activity. The following two chapters are concerned with fishing and forestry and co-operative services respectively. Co-operative integration is the subject of a further chapter which deals with the formation of unions and other representative bodies and with co-operative trading undertakings on the national, regional and local levels. The last chapter covers co-operation, the State and the community, a topic of special interest in the newly developing countries, which, on an ever-increasing scale, are using the co-operative movement to promote economic and social development of the rural as well as the urban masses. An appendix lists a useful select bibliography on co-operation.

Drozdowicz, Jakub. *Zagadnienia organizacyjne ruchu spółdzielczego w Polsce*. Biblioteka spółdzielczego instytutu badawczego, Nr. 4. Warsaw, Zakłady wydawnictw spółdzielzych, 1960. 171 pp. 29 zlotys.

LANDESBERG, Henryk. *Demokracja wewnątrzspółdzielcza*. Biblioteka spółdzielczego instytutu badawczego, Nr. 3. Warsaw, Zakłady wydawnictw spółdzielczych, 1959. 64 pp.

These booklets are destined primarily for the active members of the co-operative movement in Poland. They deal with matters such as the principles and structure of the movement, its voluntary nature, election of the various organs, and the rights and duties of the members. The second booklet devotes particular attention to the organisation and functions of the co-operatives.

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